

THE IRON AGE

ENGINEERING
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February 9, 1950

FEB 9 1950



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AGE

World's fastest strip mill has Farval automatic lubrication

THE mill that rolls tinplate at 70 miles per hour is lubricated by Farval. One heavy duty automatic system serves work roll bearings and another supplies back up roll thrusts, pressure blocks, spindle carriers, chuck slides and roll balance cylinders. Still other Farval systems are installed on the continuous pickler, flash welder and uncoiler—a total of 13 automatic and manual systems serving 561 bearings in this one steel plant department.

Since the original cold strip mill installations in 1930, more than 90% of all the continuous cold mills built have been equipped with Farval. Farval likewise serves the vast majority of the world's hot strip mills—well over 70% of the mills in America and abroad.

In short, wherever it is important that bearings function dependably under heavy pressures and at high speeds, you'll find Farval on the job. In hundreds of steel and metal-working plants, Farval Centralized Lubrication has long since proved its ability to save time, lubricant and oiling labor, eliminate bearing expense, and most important of all, reduce down time for bearing replacement or repair, and thereby increase mill and machine production.

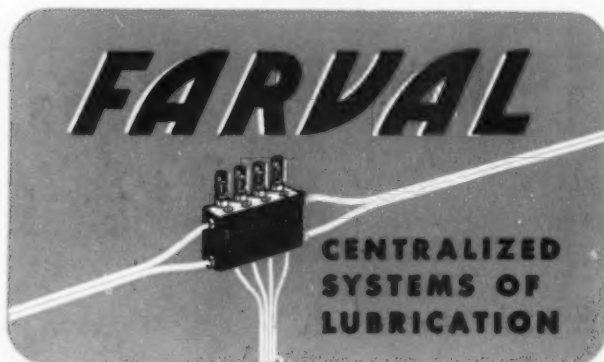
Farval has proven itself in over 20 years of service. It is the original Dualine system of centralized lubrication that others imitate. The Farval valve has only 2 moving parts—is simple, sure and foolproof, without springs, ball-checks or pinhole ports to cause trouble. Through its wide valve ports, and full hydraulic operation, Farval unfailingly delivers grease or oil to each bearing—as much as you want, exactly measured—as often as desired. Indicators at every bearing show that each valve has functioned. For a full description, write for Bulletin No. 25.

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FARVAL—
*Studies in
Centralized
Lubrication*
No. 111



4 Steps to Increased Tool Life



1. Design each tool carefully to perform its job, considering *fully* all known factors which influence tool life.

2. Select tool steel of the correct chemical analysis with the best combination of properties for each tool or die.

3. Follow heat-treatment recommendations exactly. Use lots of care in hardening and tempering. Avoid excessive decarburization.

4. Establish grinding techniques that produce the ideal surface finish for the intended service, free from grinding cracks.

If you have not been following these four steps religiously, do so and you'll increase tool life.

It's not a simple formula. Tool design must take many factors into consideration. Grinding procedure, too, is a variable that is seldom easy to perfect.

But follow these four steps, and you're headed for better performance and longer life. And we can help you when it comes to selecting the right tool steel.

Heat-treatment technique is another vital step where one of our technical men can put his finger on the spot that may be causing trouble. All of our tool-steel contact metallurgists are experienced tool hardeners, and they've helped to solve a variety of problems involving tool design and grinding.

Whether it's technical assistance or fine tool steels you need, call on Bethlehem. In our mill depot we carry ample stocks of carbon, oil- and air-hardening grades . . . shock-resisting, hot-work and high-speed steels. Just call the nearest Bethlehem sales office or tool-steel distributor for complete information.

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February 9, 1950

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THE IRON AGE

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Editorial

INDUSTRY VIEWPOINTS

Lewis-Labor's Defamer

SOONER or later the coal impasse will be settled. But this time it will not be like others. The miners—no matter what they gain—will have lost. And they will have lost because of John L. Lewis.

Every time Lewis' name came into an argument in the past it was always cinched by "Yes, but look what he has done for the miners." Certainly that statement is now in the past tense. There is no use of writing reams about him being a dictator. He is, and that's all there is to it.

There is no use raving about him being a monopolist in the coal industry. Facts speak for themselves. He was and is. There is no reason for saying he is selfish, stubborn and unforgiving; it is plain to see he is.

Oil men hail John L. Lewis. Why not? He is the best salesman they have ever had. Hundreds of thousands of people have switched to oil. And why not? Higher prices for coal and crises after crises in supplies were too much.

The miners are still with John L. But there must be many who wonder, in the quiet of their time off, whether he is the same man he used to be. When they lose pay after pay because there is no work, they have cause to wonder.

The words that Mr. Lewis uses to paraphrase his castigations of the operators would be funny if the situation were not so serious. The robot-like attitude of the rank and file miners in their blind allegiance to Mr. Lewis would be pitiful if it were not so serious. And the frustrations of coal operators would be classic if Lewis' treatment of them were not so unfair. And this treatment has been fostered by Mr. Truman's do-nothing attitude.

For months on end this country and the steel industry have been treated to the spectacle of a man who, because he can't have the moon, will take nothing less. Because of his stubbornness coal miners lose pay, cities face crises in coal needs, steel men pay gigantic sums for commercial coal, coal dealers go out of business and the President of the United States is forced to traffic with the Taft-Hartley law—a law which he claims to abhor—as a "last" resort.

What about other labor? What about people like Phil Murray who is of a different type than Mr. Lewis? What of Murray's men who will suffer because of Mr. Lewis' private defiance of the public and his government? What of damage to labor in general?

What of the operators whose market is slipping out from under them? What of Harry M. Moses, the chief negotiator for steel captive mines? A man who is and always has been fair, simple, direct and reasonable in his dealings with Mr. Lewis.

The time has come to loosen the grip of a stubborn old man on the throat of the country. A man who seems to have forgotten that he too has a responsibility to his men, to his country and to his industry.

Tom C. Campbell

Editor

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Cranes that are *tough*—that take the gaff of heavy switching operations . . . Straight, simple, Diesel cranes that stand up under the heaviest service...Simple, rugged travel gears warranted for the life of the machine . . We know that these cranes will do your work . . We back what we know with our guarantee.



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NEWSFRONT

NEWS, METHODS AND PRODUCT FORECAST

► An experimental plant has been set up in Pittsburgh to briquet flue dust and iron ore fines for blast furnace use. It is hoped that the briquetting operation will prove less expensive than the sintering plants now used in the industry.

► At least two major steel companies are reportedly looking for new plant sites—one around Norfolk, Va., and another in Chicago. This does not mean they have actual plans for mills at these spots.

► Uncertainty about coal caused Detroit steel buyers to start reaching out last week to latch onto whatever steel they could find. Even with quick settlement of the coal trouble this scramble will leave a hangover in the form of higher costs on this material for a month or so.

► Machine tools that will operate at nearly 23 times the speed of sound are about to emerge from the laboratory and minute grinding wheels for ultra precision metalworking and finishing are being driven at 200,000 rpm.

► Belgian prices on carbon steel and reinforcing bars are beginning to really worry American steel companies. By slashing export prices almost 50 pct during the past year they are able to undersell U. S. companies by about 30 pct.

► Biggest barrier to a reduction in auto price tags is the number of parts that go into a modern car. The average automobile has 2200 parts and some automatic transmissions alone use 900 parts.

Reliable reports indicate that the new Kaiser-Frazer small car has been designed with the idea of substantially reducing the number of parts in a serviceable car.

► Two new precipitation hardening stainless steels are now in production. They employ copper and aluminum as hardening elements instead of titanium or carbide formers that are commonly used.

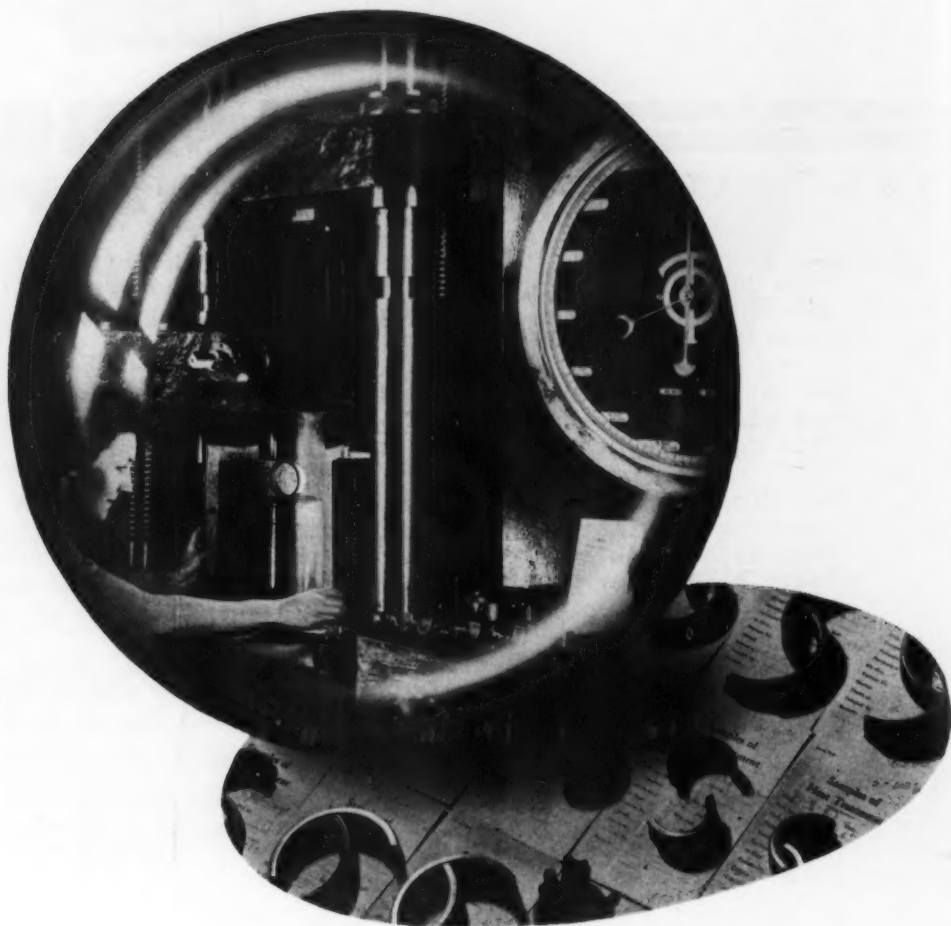
► To replace the present battery converter electrostatic generator two 10-lb spring motor driven units have been developed by the Army. They provide power supply for electron image tubes. One generates 20,000 v, the other 6000.

► The corrosive etching that normally occurs on the bottom sheet of stacks of sheet steel can be eliminated by using a specially coated chipboard. A skid loaded with 8 tons of sheets went through the steel strike with no sheet damage and no weight indentation.

► A radiation pyrometer developed for the Navy during the war has recently been adapted to measuring the temperature of tinplate as it moves swiftly on the continuous coating line.

► It is too soon to assume that the bigger steel companies have lowered their breakeven points to the neighborhood of 50 pct — just because they made money at that level during the fourth quarter. Year-end accounting practices, fourth quarter prices and product mix based on healthy business throughout the country and absence of new, higher and fixed labor costs must all be reckoned with before any company can figure what its breakeven point will be this year.

Fractured for safety



These bearing parts are part of a day's vital statistics in Federal's "bureau of standards." Here race rings and balls are crush-tested after hardening to determine their load bearing strength, etch tested for any minute cracks in the fracture and Rockwell checked for hardness.

Conditioning a Federal Ball Bearing to deliver the right degree of resilience, toughness and resistance to compression and distortion starts with hardening the race rings *right through to the core* to withstand the severe pressure of the ball on the ball track, particularly under heavy load. Automatic electric controls insure a uniform heat-treat throughout the entire Federal hardening cycle. The silky fracture

tells the "inside" story in inspection; performance proves it.

Every fourth operator is an inspector at Federal during the more than 100 individual manufacturing, inspection and cleaning operations that go into every Federal Bearing.

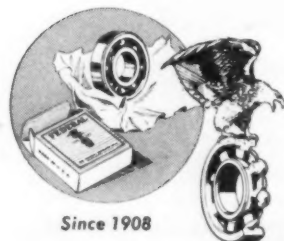
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Coal Cuts Ingot Rate To 91 Pct **IRON AND STEEL INDUSTRY TRENDS**

The Iron Age

SUMMARY

BUYERS are not breaking down the doors of mills and warehouses to get steel but they certainly are knocking with a heavy hand. Not all steel buyers: Heavy capital goods producers are rapping softly when they rap at all. The racket is coming from the men who make consumer goods.

The pattern is not the same as it has been in previous postwar days when the steelmaking rate was in the 90's. Big postwar expansion programs in steel, metalworking and chemicals are over or ending. In the capital goods line the drive is on improving existing facilities—on cost-cutting machinery and equipment. Materials handling equipment sales are rising. So are machinery sales, with emphasis on automatic welding machines and fast new machine tools, many with automatic indexing, transfer and handling devices—all designed to lower labor costs.

Sheet Demand Is Long Term

In sheet and strip steel the demand is more than a flash in the pan. It reflects the growth of the consumer durable goods market—motor cars, refrigerators, washers, etc. That it is a long term trend is verified by announcements within the past 2 weeks that more than a million tons of additional sheet and strip rolling capacity are being installed by two major steel companies. The increase will be over 2 million tons when U. S. Steel's eastern seaboard mill plans are announced.

With consumer goods production still booming and with most observers predicting a good first half a few capital goods prospects are getting a little brighter but much of them are still prospective. Inquiries for generating equipment are up sharply. Backlogs of manufacturers of food processing equipment were falling fast last fall but the picture changed in December and picked up a bit more last month.

Chemical plant construction is still off, along with most other plant construction, but steel demand for the oil and gas industries is stronger than it was a few months ago. Bridge and public building construction are keeping structural steel

fabrication at a fairly good level, and promise to do so for at least another 5 months.

Breakeven Point Still Unknown

The fact that a number of big steel companies were able to earn money during the fourth quarter of 1949 even though the steel strike held operations to around 50 pct of capacity is now being pounced upon as proof that breakeven points are back to their prewar level. This is misleading. Breakeven points have to be considered in relation to selling prices and labor costs at the time they are figured. Selling prices during the fourth quarter reflected healthy business with none of the price cutting that goes on when steel production is cut by lack of demand.

Labor costs are already higher than they were last year—and establishment of pension plans this year will add higher and fixed costs that will affect breakeven calculations. This much is true—the hundreds of millions of dollars spent since the war for plant modernization are paying off. The breakeven point today is lower than it was 2 years ago. But just how much lower is not known in the industry itself.

Mills Postpone Major Cutbacks

The slump of 2½ points this week in the national steelmaking rate is nothing compared to what will happen to steel production next week if the miners do not go back to the pits. Even this week's rate may be revised downward. Only the fact that steel companies had better than average coal stocks going into this labor trouble prevented a sharp cutback some weeks ago. However, they are fast approaching the danger point themselves and if there is no assurance of a quick return of the miners they will soon begin banking blast furnaces to protect them. This week's ingot rate is 91 pct of rated capacity. Last week's rate was revised to 93.5 pct.

Steelmaking scrap prices were generally unchanged, though Pittsburgh showed a little strength. There No. 1 heavy melting steel advanced by 50¢ a gross ton, moving THE IRON AGE steel scrap composite to new high ground for the year at \$27.25 per gross ton.

Today it's Roebling!



Why production men choose Roebling Cold Rolled Spring Steel

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Roebling Cold Rolled Spring Steel is available annealed, hard rolled untempered; scaleless tempered; tempered and polished; tempered, polished and strawed; or tempered, polished and blued.

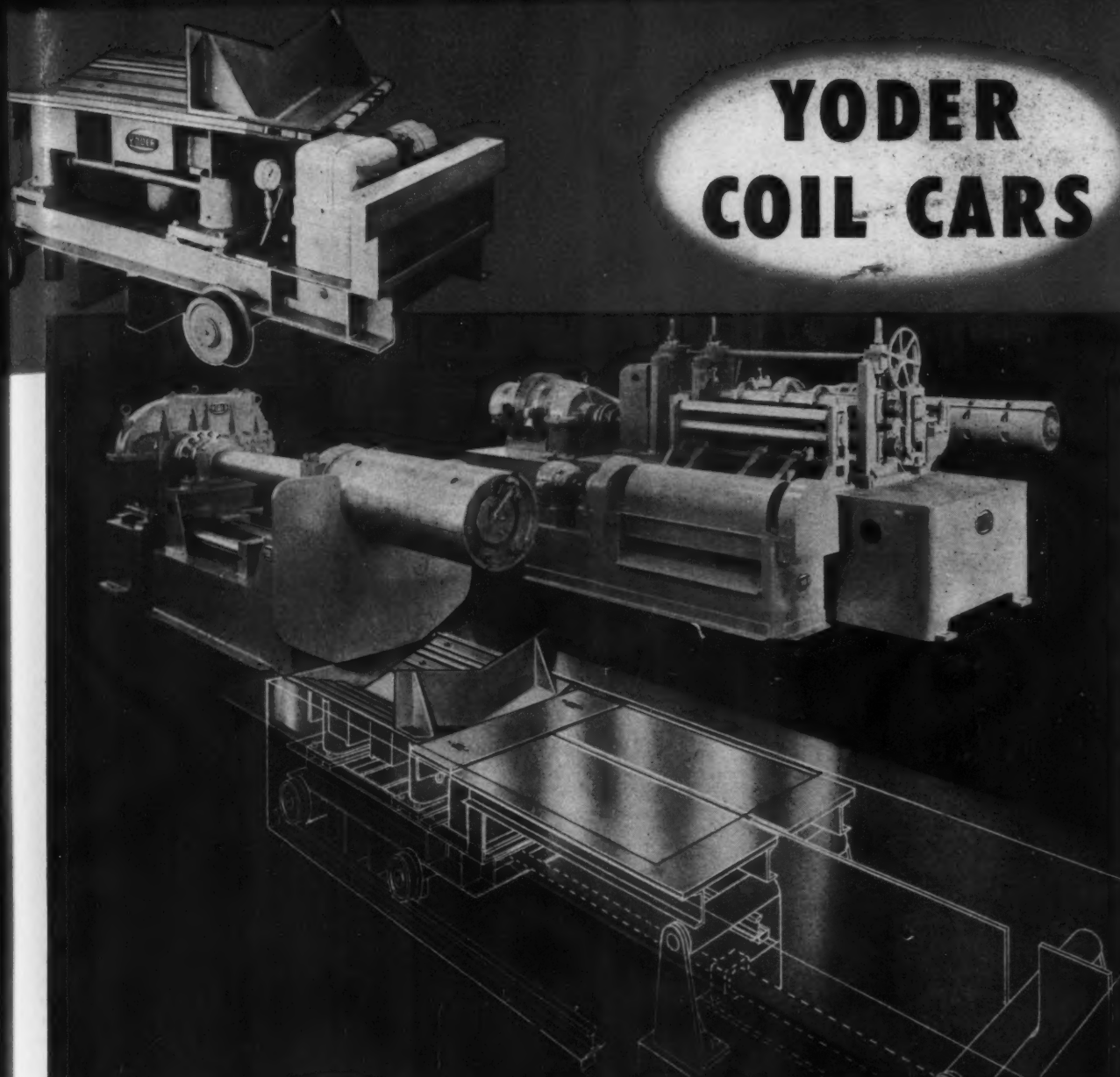
Your Roebling Field Man will gladly help you choose the cold rolled spring steel, or round, flat or shaped wire, that will improve your product and your production. John A. Roebling's Sons Company, Trenton 2, New Jersey.

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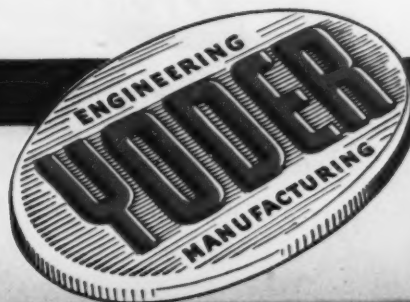
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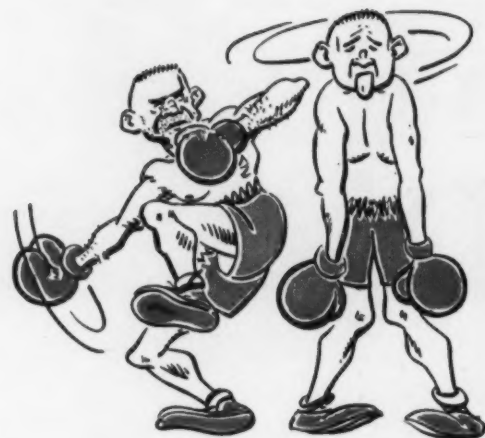
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Fatigue Cracks

By Charles T. Post

Phew!

Because fatigue occupies a prominent place in the heading for this department every week, we think it's appropriate to pause for 60 sec to ponder an item which Northern Metal Products' *Northerner* lifted from the Illinois State Labor Bulletin:

"Fifteen thousand days on the job, with 2 half days off, is a record of a kiln tender in East St. Louis. For the past 41 years he has worked 7 days a week without vacation, and without being off the job because of illness."

"In 1914 he took a half day off to be married. In 1945 he took the other half day off to bury his wife."

"Not only has he been on the job every day, but it is reported that he has spent at least four additional hours around the plant because, as he explains it, he doesn't know what to do with himself when he is not working."

At the risk of running competition to Dorothy Dix: Since the gentleman seems to be a demon for punishment, why doesn't he take a couple of hours to look for another wife?

Asiatic Threat

Since our text for today comes from the daily press, we can't pass

without comment a news item quoting Radio Tibet as saying, "in a thin, quavering voice," that the Dalai Lama is "shocked at the threat of Communist invasion."

We can turn our back on the loss of China and shrug at the threat to Formosa, but if Shangri-La is threatened—then, men, it's time to fight. Formosa may not be of strategic importance, if we take Secretary Acheson's word for it, but we can't lose Shangri-La. We might find another take-off point for our bombers, even though Doolittle's Tokyo raid was a thriller, but there'll never be another place like it on which to base our dreams.

Testimony

Your f.f.j.'s editor, Tom C. Campbell, an authority on the steel industry's public relations, may want to dissect the testimony of Jones & Laughlin president Ben Moreell before the Senate-House Economic Committee, as quoted verbatim from the Detroit Free Press:

"To me it appears that steel prices have so lagged behind other prices that at present the steel industry is wasting its asses."

"We are ossing them in free with every ton of steel sold."

We're burying the item in the "bet he never said it" file. On second thought, though, the circula-

Turn to Page 143

FARQUHAR HYDRAULIC PRESSES

turn out heating units
on production line basis
at Pittsburgh plant



The Edwin L. Wiegand Company, of Pittsburgh, Pa., turns to Farquhar Hydraulic Presses for efficient production line help in the manufacture of Chromolox heating units.

In the installation shown here, a Farquhar Press (foreground) crimps the ends of heater bars and compresses the sealer at the ends. A second Farquhar Press (background) shapes the entire heater bar from round to triangular shape.

These two "on line" operations dovetail perfectly into Wiegand's over-all production setup for this particular operation. It's the same story over and over again throughout industry—Farquhar Hydraulic Presses *can* and *do* step up production . . . cut costs . . . in the shop or on the line.

Farquhar Hydraulic Presses are built for the job . . . assure *faster production* due to rapid advance and return of the ram . . . *greater accuracy* because of extra guides on moving platen . . . *easy, smooth operation* with finger-tip controls . . . *longer die life* due to positive control of speed and pressure on the die.

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Drawing - Extruding - Drawing - Forging - and other Metalworking Operations

Iron Age

Introduces



STODDARD M. STEVENS, director, Babcock & Wilcox Co.



F. J. SIKOROVSKY, president, Federal Drill & Tool Works.



DOUGLAS B. STEIMLE, director, Air Reduction Co., Inc.

Stoddard M. Stevens, a partner in the law firm of Sullivan and Cromwell, New York, was elected a director of the **BABCOCK & WILCOX CO.**, New York, at a recent board meeting.

Frederick Bowes, Jr., has been appointed director of public relations and advertising for **PITNEY-BOWES, INC.**, of Stamford, Conn. Other appointments include **Joseph J. Morrow**, new personnel manager, and **James L. Turrentine**, new assistant manager of public relations.

T. W. (Ted) Marx has joined Republic Rubber division, **LEE RUBBER & TIRE CORP.**, Youngstown, as sales representative in the Pacific Northwest. Mr. Marx will headquarter in Portland and cover Oregon, Washington, northern Idaho, and a portion of Montana.

F. J. Sikorovsky becomes president of the **FEDERAL DRILL & TOOL WORKS**, New York, a division of **Avildsen Tools & Machines, Inc.** Mr. Sikorovsky will make his headquarters in the company's New York plant. He was also elected a member of the board of directors of **Avildsen Tools and Machines, Inc.**, which operates plants in Chicago and New York.

Calbert L. Dings was named a sales representative in **ALLIS-CHALMERS** Charlotte, N. C., district office. A 1948 graduate of the University of Wisconsin, he recently completed the company's graduate training course.

R. G. Fredette, formerly with **Raytheon Mfg. Corp.**, has become production manager for **HUNT-SPILLER MFG. CORP.**, Boston.

Douglas B. Steimle, a member of the law firm of **Shearman and Sterling and Wright**, was named a director of the **AIR REDUCTION CO., INC.**, New York.

C. B. McManus, **Joseph H. Girdler** and **Howard B. Johnson** were elected directors of **ATLANTIC STEEL CO.**, Atlanta. Mr. McManus is the president of the **Georgia Power Co.**, while both Mr. Girdler and Mr. Johnson are vice presidents in **Atlantic Steel Co.**

Hollis M. Mosher has been named sales engineer for **ILLINOIS TOOL WORKS**, Chicago. Prior to coming with the company, he was associated with the Detroit sales office of the **Firth Sterling Steel Co.** of **McKeesport, Pa.**

Iron Age *Salutes*

CHARLES R. COX



C. E. BALES, president, Ironton Fire Brick Co.

C. E. Bales has been elected president of the IRONTON FIRE BRICK CO., Ironton, Ohio. He was formerly vice president and succeeds E. F. Myers who becomes board chairman and treasurer.

M. D. Barry has been promoted from chief accountant to comptroller by SOUTHERN STATES IRON ROOFING CO., Savannah, Ga. Mr. Barry has been with the company since 1940, having started his career there as an inventory clerk in the accounting department.

Robert C. Stockton was appointed general traffic manager of STEWART-WARNER CORP., Chicago. Mr. Stockton fills the position left vacant by the death of E. F. Stecher.

Turn to Page 126

WHAT'S one person's loss is another's gain. Nothing was more true when Charley Cox left the steel industry and went to the nonferrous field. But in this case he left a host of friends in steel and is gaining just as many in his new job.

There is no use trying to call Charley Mr. Cox. It just won't work. After you talk to him a minute you feel that he has been your friend for a long time. And besides if you were his enemy or he yours, you would not call him Mister anyway.

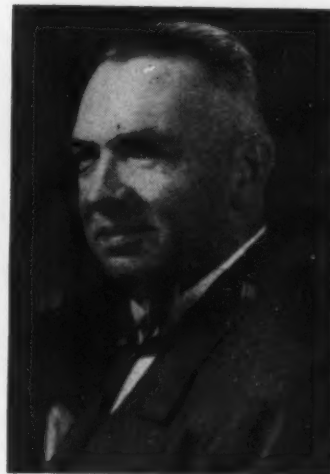
When Charley left the presidency of Carnegie-Illinois Steel Corp., U. S. Steel's biggest subsidiary, he left a lot of people who were wishing all kinds of good things for him. Not the least of these were the officials of the companies where he has worked.

Charley became president of Kennecott Copper Corp. just a little over a month ago. Already his new associates are seeing why he was called a ball of fire. He won't stand on ceremony. And he hates to waste time beating around the bush. He doesn't do it. If the other fellow does he soon hears about it.

He is sitting in the seat of a great fellow who died in an airplane accident recently, E. T. Stannard. Charley knows this and is doing everything he can to live up to the standard Mr. Stannard set.

In the 16 years Charley was with U. S. Steel he went up fast. He was hardly in his seat before he became general superintendent of National Tube's Ellwood Works. And it wasn't but 2 years more before he became operations vice-president of National Tube.

Charley always knew what he



wanted. He was and is a tough hombre. He doesn't like to tell someone twice what he wants. But yet he has done it and still does it in a way that draws people to him. People who swear at and by him. In the end he gets the job done with no horsing around.

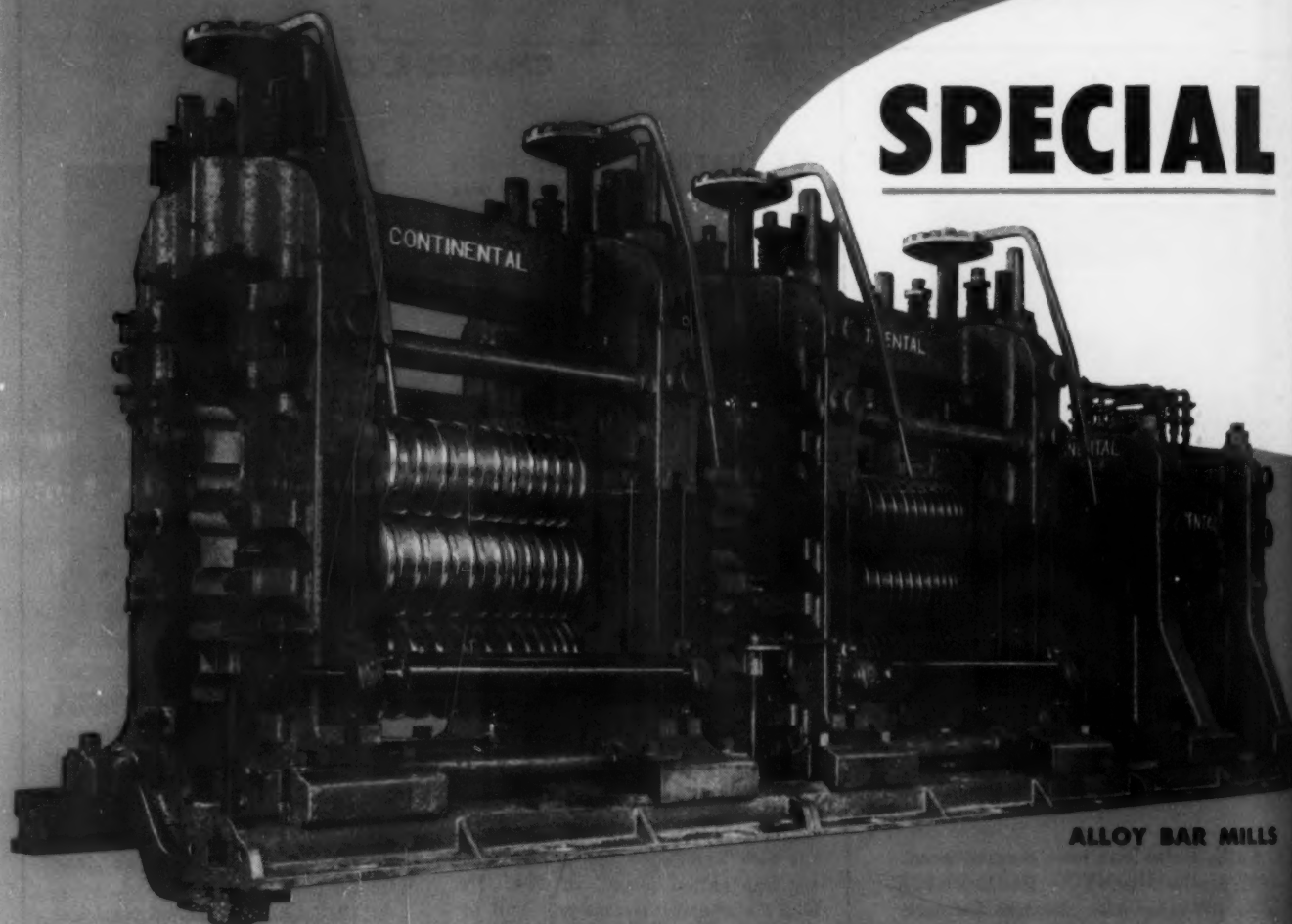
In 1943 Charley headed National Tube and by 1946 he was at the helm of Carnegie-Illinois Steel Corp. He was always cost conscious. He used the biggest magnifying glass he could find to cut costs while at Carnegie. When he left there were no scars either in that company or in the U. S. Steel Corp. proper.

They were sorry to see him leave but they were glad that he went to a bigger job. From last reports Charley is doing the same kind of a job at a different stand. He is knocking formality for a row. He is making more friends than you can shake a stick at and he is more impatient than ever to get things done.

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In plant after plant they are finding that the extra sharpness of 32 ALUNDUM wheels enables them to remove stock from high speed steel and cast alloy tools at the rate of .002" to .003" per pass as compared to .0005" for ordinary tool wheels.

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And "32" wheels stay sharp longer. You can go all the way around even a large multi-tooth cutter without having to stop and dress a 32 ALUNDUM wheel.

Less Tool Spoilage

32 ALUNDUM grinding wheels cut so cool that there's far less danger of spoiling heat-sensitive high speed steel tools—even with inexperienced operators.

Here's the Reason for "32's" Record Breaking Performance —

The grains of 32 ALUNDUM abrasive are produced by a special, patented electric furnace process which gives them many sharp points on all sides—no matter how they are bonded into a wheel each grain presents one or more cutting faces. And because the grains are over 99% pure fused alumina they have exceptional resistance to dulling.

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162 Pages of Practical Information—That's what you get in this Norton Handbook on Tool Room Grinding. It tells you when to use 32 ALUNDUM wheels and when to use the other Norton abrasives—such as 36 ALUNDUM, 57 ALUNDUM and regular ALUNDUM, to cut tool room costs. Send for your copy—just ask for form 835-H.



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GLOBAL LETTER

REVIEW OF WORLD MARKETS



Sweden to peg wages and prices . . . Loan to mining firm will be repaid with lead and zinc . . . British politicians getting ready for election battle with limited funds.

Stockholm—The Swedish Government has reached an agreement with trade unions and employers' associations to peg wages at their present levels for the whole year—provided prices are also pegged.

The Trade Union Federation and the employers have agreed that if the government fails to check price rises, and the cost-of-living index rises above a certain limit, wages are to rise. Should the employers find they cannot afford the rise, they and the unions are to enter into negotiation.

Will Make New Car

Sweden's industries will invest about \$245.1 million in new buildings and other fixed property. Over one-third of the total amount will be invested by the mining, iron and steel industries and about a quarter of it by the power stations.

The Trollhattan factories, which formerly made airplanes, have started manufacturing a small automobile. The new car is a four-seater sedan of 7 hp, with a maximum speed of about 60 mph. It will sell for about \$1,158.

Transport of ore from Kiruna

and Gällivare over the State Railways was the highest last year since 1937. In 1949, 10,532,401 tons were carried compared with 10,497,777 tons in 1948 and 10,811,370 tons in 1937, the record year.

Loan to Aid Mining

Representatives of the ECA mission to Sweden and the Swedish Government have signed a Marshall Plan industry loan to Sweden for a maximum of \$350,000. The funds will be used to give A. B. Zinkgruvor Co. the opportunity of buying special mining equipment in the United States. This is part of the company's long-range program to expand operations in four zinc-lead-copper mines near Falun.

Repaying With Metal

The company has declared that it would seek to raise about six times the amount of the loan in Swedish kronor from its own sources and from the Skandinaviska Banken for the expansion program. Pumping and hoisting equipment will be purchased in Western Europe. Delivery of the mining equipment from the U. S. will take about 9 months.

The ECA mission chief in Sweden said that the loan agreement was based on the principle that the U. S. Government would be repaid in zinc or lead or both. If the entire expansion program of the company is realized, he said, the metal repayment will take only a very minor percentage of the anticipated annual production until the loan has been amortized. Repayment is slated to begin in 1952.

Politicians Oil Big Guns For British Election Battle

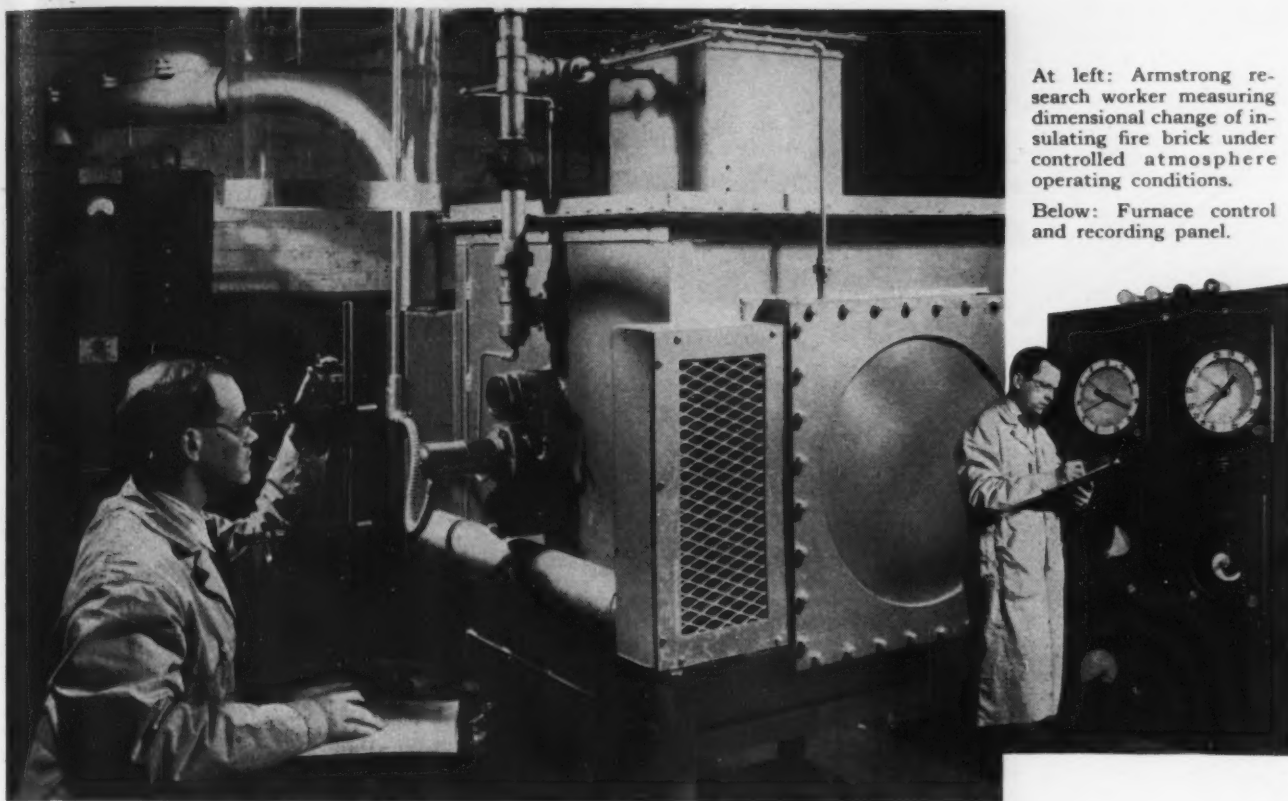
London—Decks are being cleared for the general election on Feb. 23, but the battle hasn't really commenced. Only a few skirmishing shots have been fired by both sides. Longer notice of the election has been given on this occasion than in the past.

Candidates are permitted to spend only a limited amount of money on the election and are saving it up for the final 2 weeks. There have been renewed warnings about the amount that can be spent and the items which can be counted as election expense.

Here Are the Issues

Industrialists are taking an extremely keen interest in the forthcoming election because of its bearing on production policy. Both the Conservative and Labor parties have issued their manifestoes,

Turn to Page 144B



At left: Armstrong research worker measuring dimensional change of insulating fire brick under controlled atmosphere operating conditions.

Below: Furnace control and recording panel.

Controlled Atmosphere Test Furnace Helps Solve Insulating Refractory Problems

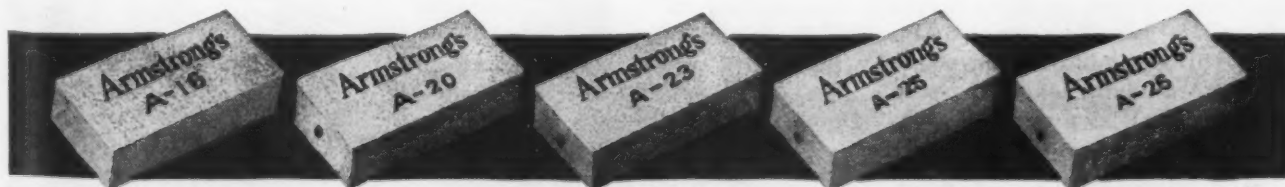
One of the urgent needs of the furnace building industry today is for more information on the effects of controlled atmospheres on insulating fire brick. To find the answers to the many questions being asked, Armstrong research scientists have designed and built a unique testing furnace. Here they can simulate any commercial atmosphere condition.

A comprehensive, long-range testing program is already under way to determine the effects of endothermic, exothermic, and dissociated ammonia gases on insulating fire brick and refractory cements. Studies are also being conducted to provide users of Armstrong's Insulating Fire Brick with the answers to specific questions on individual special atmosphere furnace problems.

This furnace is designed not only to test single brick specimens but also the performance of entire wall or arch constructions. Tests can also be made on the effects of insulating fire brick linings on the controlled atmospheres used.

This new furnace is an important addition to the many units of modern research equipment used daily to guard the quality of Armstrong's Insulating Fire Brick and refractory cements and to develop and test new products and uses.

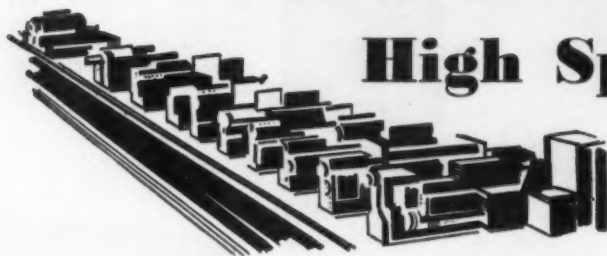
For assistance in the solution of any problem involving the use of insulating fire brick and refractory cements, call the Armstrong office nearest you or write directly to Armstrong Cork Company, 4902-A Mulberry Street, Lancaster, Pennsylvania.



ARMSTRONG'S INSULATING REFRACTORIES

MACHINE TOOL

High Spots



Sales
Inquiries
and Production



by

William A. Lloyd

Orders piling up in machine tool industry . . . Volume production set for June in Ford-Cincinnati plant.

Cleveland—Automotive demand is in the spotlight this week in Detroit. The "busy signals" are flying on machine tool plants more frequently than at any time since World War II days.

Producers of special tooling are piling up substantial backlogs of orders for new equipment to be used for new high compression engines and automatic transmissions that are sweeping the industry. A prediction made a few months ago in Detroit that all car producers would have new engines and transmissions within two years seems to be on the pessimistic side. As a matter of fact, most of the programs visualized in that forecast are either under way or will be launched in the near future.

Ford plans have been somewhat clarified during the past week. It now appears that the Ford in-line six and the new Mercury eight engine will be built in Cleveland. The Ford and Lincoln power plants as well as a new truck engine seem to be set for Detroit.

Meanwhile, ordering is going forward for equipment to be delivered to Ford-Cincinnati, where a new automatic transmission

plant is under construction. The tentative date for volume production in this plant has been set for June.

New Six Built at DeSoto

The strike at Chrysler has slowed up but has not halted work on the new Chrysler engines. It is now reported that the new six will be built at DeSoto while the high compression V-8 will be assembled at the Jefferson plant. There is some indication that Chrysler may decide to continue with an in-line eight cylinder engine.

GM Transmission Orders Rise

A substantial number of orders has been reported for the Detroit transmission division of General Motors. Much of this equipment will undoubtedly go to the new plant on Plymouth Road, just outside of Detroit.

The amount of new tooling for the engine Willys will build for the K-F light car is not expected to be large, although some inquiries have been reported.

Coupled with the major programs of large auto makers here, there has also been a marked increase in inquiries from small

shops, according to trade sources.

In other machine tool markets, new order volume is adequate but spotty. Inquiries and quotations are numerous and some plants are figuring on more work than at any time since last Fall.

As a fillip to the efforts of some segments of the industry to get replacement business, as reported in this space last week, a sales executive told THE IRON AGE this week that if he replaced two per cent of the machines sold by his company that have been in use 15 years or longer, the problem of making a profit on a substantially lower volume would be a thing of the past.

New Machine Tools Operate At Supersonic Speeds ASTE Told

Portland, Me.—Machine tools operating at speeds more than 20 times faster than sound and containing long-wearing movable parts are being developed, according to W. W. Goehring, anti-friction bearing engineer of SKF Industries, Inc., Philadelphia.

In an address before the local chapter of the American Society of Tool Engineers, Mr. Goehring stated that even these speeds will soon be surpassed. He attributed the present supersonic speeds to stronger and more versatile metals, precision ball and roller bearings and improved lubricants.

Spindle speeds of some grinding machines now being tested surpass 200,000 rpm. "If an automobile wheel could be made to go as fast, it would reach a speed of 16,660 mph or 22.9 times the speed of sound," Goehring said.

Such speeds in machine tools make possible more efficient grinding of metal parts, which results in finer surface finish. Surfaces of ball and roller bearings, for example, which can be ground to within a few one-millionths of an inch of being free from irregularities, enable machines to work more accurately, operate quieter and last longer," Goehring explained.

Complete line of STEEL MILL CHAINS



ON COOLING BEDS



HOT STRIP TRANSFER



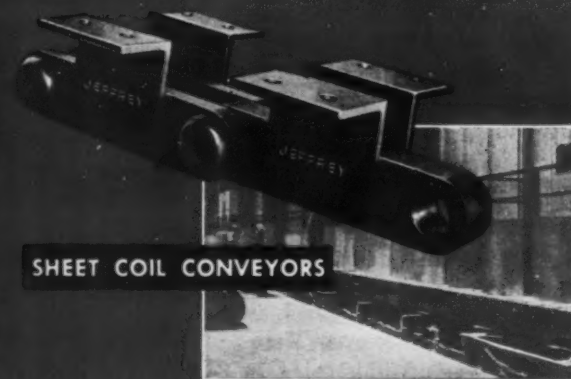
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DRAW BENCH CHAIN



HOT COIL CONVEYORS



SHEET COIL CONVEYORS

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Processing and
Mining Equipment



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PUBLICATIONS

Geared Head Lathes

Special type R Sebastian geared head lathes are described and illustrated in a 4-p. folder giving specifications for various lathes equipped with clutch and brake, metric screw, line shaft drive and bed turret, and a gap lathe is also described. *King Machine Tool Div., American Steel Foundries. For more information, check No. 1 on the postcard.*

High Strength Steel

Otiscoloy, a high strength-low alloy steel for transportation and heavy construction equipment, is described in a new 33-p. booklet containing photographs of the variety of applications for this ductile, high weldability material. *Jones & Laughlin Steel Corp. For more information, check No. 2 on the postcard.*

Variable Speed Drive

A standard make of motor, Reeves speed control mechanism and, where required, helical gear speed reducers, are combined in one single unit, the Reeves Motordrive, described and illustrated in a 38-p. catalog containing 13 pages of rating and overhung load and thrust capacity tables. *Reeves Pulley Co. For more information, check No. 3 on the postcard.*

Metal Cleaning

Prepared primarily for use by production managers, paint technical, service and sales engineers, process engineers and paint superintendents or consultants, an 84-p. manual contains useful information on products and methods for

New publications that describe money saving equipment and services are available free and without obligation. Copies can be obtained by filling in the attached card and mailing it.

metal conditioning and cleaning. *Neilson Chemical Co. For more information, check No. 4 on the postcard.*

Heat Treating Furnaces

Heat treating furnaces for every need, including annealing, galvanizing, continuous bloom, billet and slab heating, salt descaling and open hearth furnaces, embodying the patented F.E.I. combustion system, are described in an illustrated bulletin. *Furnace Engineers, Inc. For more information, check No. 5 on the postcard.*

Milling and Grinding

Descriptions and illustrations of equipment for milling, die sinking, broaching, cutter and tool grinding, optical projection profile grinding, precision grinding, centerless lapping, flame hardening and cutting fluid are given in a new 47-p. catalog. *Cincinnati Milling and Grinding Machines, Inc. For more information, check No. 6 on the postcard.*

Bearings and Bushings

The 1950 edition of the 84-p. illustrated industrial bearing catalog contains several new electric

motor bearings in addition to the extensive listing of bronze bushings and bearings, bar bronze and bab-bitt. *Johnson Bronze Co. For more information, check No. 7 on the postcard.*

Abrasive Belts

Case history examples and technical data on grinding and polishing with abrasive belts are provided in a new 36-p. booklet, which also covers the new pre-finishing technique, and gives details on belts, contact wheels and equipment. *Minnesota Mining and Mfg. Co. For more information, check No. 8 on the postcard.*

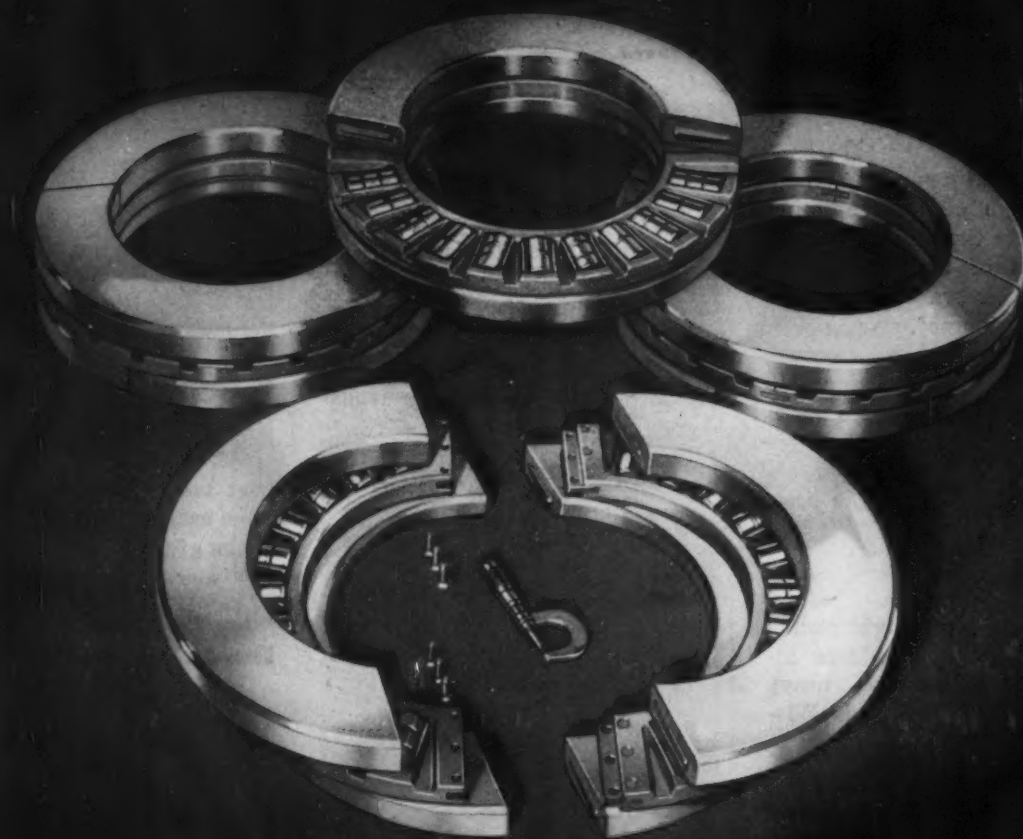
Metalworking Machinery

Equipment for bending, forming, forging and rolling, such as presses, benders, shears and punches are described in an illustrated 78-p. catalog. *Williams, White & Co. For more information, check No. 9 on the postcard.*

Nonferrous Castings

An 18-p. illustrated booklet describes the Wellman facilities for making patterns and castings of magnesium-, aluminum-, and copper-base alloys as well as Ampco

Turn to Page 136



Special KAYDON Roller Thrust Bearings, 9.437" x 15.125" x 3.500", with split races and split cage

KAYDON *Split* BEARINGS

Easy to put on or take off without dismantling machine

EASY on . . . easy off! These special KAYDON Roller Thrust Bearings have split races and a split cage . . . so you don't have to dismantle the machine to assemble them into position or to remove them from the shaft. There are many applications where this unique type of bearing is a big saver of time and money.

The precision engineering and ingenuity which make these special bearings perform so successfully are major factors in KAYDON procedure to assure dependable quality, rugged strength, and high precision in all KAYDON standard and special bearings . . . from 4" bore to the extremely large KAYDON Bearings, up to 10 feet outside

diameter. • In many fields of heavy-duty machinery, KAYDON Bearings help designers add important advantages. Steel mill equipment that operates under terrific loads and high temperatures, mammoth paper mill machinery, huge precision grinders, rugged road-building units, excavators, hoists, crushers, bending machines and other heavy-duty machines, are serving industry better because of KAYDON Bearings.

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Expand your opportunities through use of these modern bearings. Capacity now available for all types and sizes. Contact KAYDON, in confidence!

KAYDON Types of Standard or Special Bearings:

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THE KAYDON ENGINEERING CORP., MUSKEGON, MICH.

All types of Ball and Roller Bearings 4" bore to 120" outside diameter

NEW

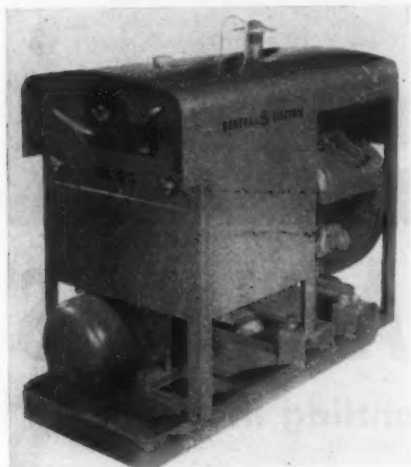
PRODUCTION IDEAS

Continued

the prelubricated-for-life cartridge bearings and a new brake lining that eliminates the need of adjustments. Heart of the unit is the Crocker-Wheeler brake that can be mounted on dripproof, splashproof, or totally enclosed motors to make a brakemotor in ratings from 1 to 60 hp. The brake uses bonded metal brake linings. *Crocker-Wheeler Electric Mfg. Co. For more information, check No. 23 on the postcard on p. 35.*

DC Arc Welders

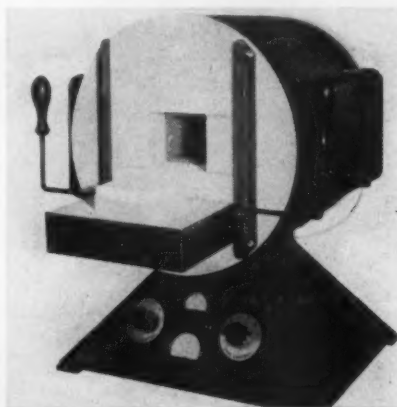
A new line of lightweight mobile engine-driven dc arc welders includes a general-purpose, heavy duty welder, driven by a 31-hp Wis-



consin VP-4 air-cooled engine with a magneto ignition. The welder weighs 1050 lb and its rated output is 200 amp at 40 v. The welder is also available with a four-cylinder, liquid cooled Hercules engine drive. Two other welders in the line are powered by a six-cylinder 63 hp Chrysler industrial engine, one rated at 300 amp at 40 v. A 400-amp model has a welding range of 80 to 500 amp. Both models are equipped with belt-driven governors. There are four welders in the diesel-drive line, two in the 300 amp and two in the 400 amp line. *General Electric Co. For more information, check No. 24 on the postcard on p. 35.*

Electric Muffle Furnace

A new electric muffle furnace is designed for laboratory use, providing an operating range of 1700° to 2600°F using Globar heating elements and it is equipped with a ceramic muffle. Manual control is provided by a tap-changing trans-



former mounted in the furnace base. Standard equipment includes an ammeter as well as an indicating pyrometer with noble metal thermocouple. Electrical rating is 3500 v. Furnaces are offered for 115 v, 60 cycles or 230 v, 60 cycles, ac. *Hevi Duty Electric Co. For more information, check No. 25 on the postcard on p. 35.*

Cast Iron Electrode

Recommended for general welding of cast iron, especially wherever free machinability and color match are required, a new cast iron electrode has a core that is more than 99 pct nickel and is 15 in. long. The electrode is designed for ac or dc straight or reverse polarity and amperages ranging from 40 to 180 depending on diameter. Welds are ductile. *All-State Welding Alloys Co., Inc. For more information, check No. 26 on the postcard on p. 35.*

Hand Lapping Machine

Speed and capacity for rapid processing in small lot manufacture and tool room requirements feature

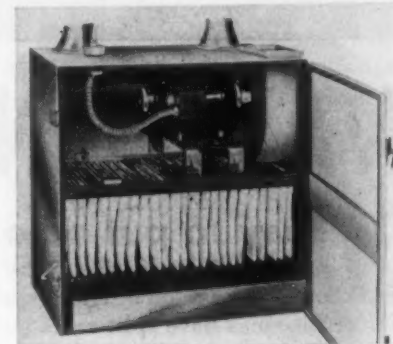
a new hand lapping machine. Lapping plates are 24-in. diam and furnished plain for cylindrical work or grooved for flat work. Constructed of close-grained cast iron, they are



heat treated to prevent distortion from seasonal changes and are precision ground. *Taft Peirce Mfg. Co. For more information, check No. 27 on the postcard on p. 35.*

Dust Collector

Recommended for use with 2-wheel buffers and polishers, a dust collector exhausts air inside the building, no outside pipes are required. The dust and grit laden air is thoroughly filtered through closely woven fabric and steel wool filter bags. Heavy particles are di-



rected downward by baffle plate directly into a large tray. A foot lever shakes and cleans the bags into a removable tray. *Hisey-Wolf Machine Co. For more information, check No. 28 on the postcard on p. 35.*

Retractable Tool Holder

A retractable threading tool holder for use on the cross-slide of Warner & Swasey turret lathes automatically withdraws the tool from the work at any desired point, permitting cuts at full speed close up

Turn to Page 138

the New Arithmetic in Steel



Make each ton of steel go farther. Get four products in place of three from the same amount of steel. Let the high physical properties of N-A-X HIGH-TENSILE take the place of mass in your product design to boost production per ton as much as 33%. This new efficiency in the use of steel is part of industry's constant search for better materials.

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Let us talk over with you the application of N-A-X HIGH-TENSILE to your product. We believe we can show you how to increase production per ton as much as 33%.

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February 9, 1950

On the ASSEMBLY LINE

AUTOMOTIVE NEWS AND OPINIONS

Ford discloses its step-by-step procedure in handling labor negotiations . . . GM and Ford are setting a record-breaking pace . . . Hudson cuts prices . . . Willys has new "Jeep"



by

Walter G. Pottner

Detroit—Labor relations is now big business.

With Ford Motor Co., for example, collective bargaining is a year-around activity. Compiling labor and economic statistics and studying labor trends and labor legislation occupies the energies of a very large Ford staff, including several Ford departments.

Last week, Mel B. Lindquist, general industrial relations manager of the Ford Motor Co., told the National Forum on Trucking Industrial Relations about the detailed preparations Ford made for its negotiations with the UAW-CIO last summer. The facts disclosed by Lindquist clearly reveal the pace even a large company like Ford has to set to keep up with the bright-eyed statisticians and econ-

omists now employed by the auto union. Ford's experience also emphasizes the difficulties confronting smaller companies in their efforts to match economic wits with trained and experienced union bargaining teams.

Can't Play by Ear

"To play by ear at the bargaining tables is no longer possible," Lindquist said. Business-like bargaining calls for a thorough grasp of the many and varied problems of labor relations, full understanding of Federal, State and Local legislation and administrative procedures, a ready supply of pertinent facts and figures and a logical presentation of proposals, he argued.

The bulk of the work at Ford is carried on by the Industrial Relations Div. which coordinates the work of eight other departments in Industrial Relations. This department at Ford gathers data on payrolls, wages, turnover, absenteeism, grievances, work stoppages, employee age and seniority. As bargaining time nears, comparative statistics for the automotive industry and the nation as a whole are added to the Ford data.

Work Begins Early

A running analysis of current bargaining trends is also kept. Months before bargaining begins at Ford, the "probable" demands of the union are broken down and

costs of possible union proposals are estimated. A close check on legislation was especially helpful at a time when pension plans and other Social Security legislation was before Congress, Mr. Lindquist said.

Through employee opinion surveys, Ford also attempts to learn what its workers are thinking. "Union leaders do not always accurately reflect the true wishes of the rank and file membership," he said.

Studies Union Statements

Ford also studies union statements and tactics likely to be employed in negotiations.

Months before negotiations began last June, a pre-negotiations committee was appointed at Ford to appraise the situation. This group was made up of all organizational elements of the company—finance, legal, economic analysis, sales, public relations, engineering and manufacturing.

Ford also called in a number of specialists, including authorities on retirement plans. Prior to the start of negotiations the company presented to the union a list of proposals it intended to bring into the negotiations.

Members of the Ford negotiating team carried into the bargaining sessions handbooks containing statistical information gathered prior to the meetings with the union. Another handbook was de-



PRECISION

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courtesy
The
Boeing
Airplane
Company

It takes a lot of big tooling — precision tooling — to build the Boeing Stratojet Precision Bomber, and the PRATT & WHITNEY 4E JIG BORER helps to provide it. With this big new machine, Boeing locates, bores and checks heavy work for the B-47's to .0002" accuracy . . . attains maximum productivity and economy from the 4E's new features which include push button control for all motions . . . electronically controlled milling feeds infinitely variable from 1" to 15" per minute . . . electrolimit spacing. These, and other advanced design features, provide operating speed and accuracy in this 15 ton machine equal to that obtained with smaller, lighter equipment. Table size is 36" x 72" (machine can be furnished with several column heights and with several types of rotary tables). Newly published Bulletin tells more about this most modern of Jig Borers; write for your copy.

PRATT & WHITNEY

Division Niles-Bement-Pond Company
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4E JIG BORER

February 9, 1950

voted to pensions — analyses of plans proposed and in existence, the possible effect of Social Security as it is now and as it might be in the future. Another handbook contained information on Ford contract negotiations and those of other companies.

While Mr. Lindquist agreed that much of the material compiled was never used, he indicated that a great deal of time and patience was saved by being prepared in advance to refute any unreasonable statements made by union representatives.

Keep Government Out

In his speech Mr. Lindquist also made it clear that, in his opinion, collective bargaining can never be made to work if either the company or the union relies on government "fact finding" as a basis for settlement of labor disputes.

"Only so long as we retain the right and freedom to work out our own solutions, with a minimum of intervention—and only so long as both labor and management want to use it with determination—will collective bargaining continue to be a useful device," Lindquist asserted.

The Ford Motor Co., he said, is opposed to the setting of patterns for whole industries or segments of industries which, he declared, works a hardship on marginal producers and often only invites the unions to say, "We've got that much already. Now what else can we get."

Willys Builds New Vehicle

Willys-Overland is building a new special type four-wheel vehicle to be used as an Overseas field personnel and cargo carrier. There are two models, one with 104½ in. wheelbase and the other with 118 in. wheelbase. Both will accommodate eight passengers and a driver or a three-quarter ton cargo load. The models are provided with seats extending the full length along both sides. A removable canvas top covers the body with a removable fly to cover the open cab.

Car, Truck and Bus Assembly Reached New High During 1949

An all-time record for new car, truck and bus assembly was made during 1949 according to official factory sales figures compiled by the Automobile Manufacturers Association. Total 1949 production was 6,238,088 units. This production record exceeded the 1929 total by 16 pct and the 1948 total by 18 pct.

Nearly 6 million units of the 1949 production total were sold in the domestic market. The export market dropped 36 pct under 1948. New passenger car production increased 31 pct over the 1948 total while truck production declined 18 pct, according to the AMA.

General Motors and Ford Seeking All-Out Production

General Motors and Ford are pulling out all the stops to raise car production in the face of a threatened industry-wide shutdown because of the coal shortage.

GM's production during January was 275,852 passenger cars and trucks in U. S. and Canada. The January GM output exceeded every month during 1949 but August. The Chevrolet output was 149,851 units. Among the GM divisions, Buick was second place with 38,184 passenger cars assembled.

Meanwhile, Ford was achieving a new postwar record in January. By the end of March, Ford expects to build more than 8,000 cars per day, assuming labor and materials are available. Last week, Ford announced that nearly 15,000 hourly workers will go on a six-day week at the Rouge.

Ford Aiming High

Ford hopes to achieve during the first six months of 1950 the highest six months' production in the company's history. On January 31, Ford assembled 7,220 units, thereby establishing a postwar record.

The Ford production increase for 1949 was 53 pct, the highest percentage gain registered by any maker of cars in the industry, according to a Ford spokesman.

The 15,000 Rouge workers began extra day operations last Saturday in seven Ford divisions. The company plans to continue its extended workweek through May. Most Ford final assembly operations are on a nine-hour day basis.

Ford schedules call for five hours of overtime each week during February at 14 assembly plants. At Highland Park and Long Beach, Calif., Ford workers will put in ten extra hours each week during the month.

Meanwhile, Chrysler remains on strike. Possibilities of an early settlement are poor. There is no indication at this time that either the company or the union are inclined to recede from the position taken at the time the strike was called.

Hudson Cars Priced Lower

Excluding the new Hudson Pace-maker models, 1950 Hudson cars which went on sale this week are priced from \$88 to \$167 lower than the 1949 predecessor models.

In announcing the price cuts, A. E. Barit, Hudson president, said: "These are not token price reductions but represent substantial savings to the customers in the price of the new cars." All Hudson Super and Custom Commodore prices are affected.

Unions Call Truce on Raiding

A no-raiding pact has been made recently between the United Auto Workers-CIO and the International Association of Machinists, unaffiliated, according to Walter Reuther and Al Hayes, union chiefs.

All plants in the United States, except four where representation disputes are pending, will be covered in the agreement. The four plants presently involved in representation disputes are Autolite at Lockland, Carter Carburetor Corp. of St. Louis, International Harvester at Melrose Park and Mueller Brass Co. of Port Huron. Also, International Harvester's plant at Stockton will be subject to further discussion before inclusion within the agreement.

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WEST COAST PROGRESS REPORT



Outlook for steel producers and fabricators brighter . . . Steel foundries in slump . . . Salt Lake City beats smoke pollution.

Digest of Far West Industrial Activity



by

J. Reinhardt

San Francisco—Acres and acres of gaunt steel skeletons reaching into the sky, each surrounded by piles of bent steel bars, would be a nightmare to most persons but to steel fabricators it is just a beautiful dream.

There is some reason to believe that such a dream may come partially true during 1950 for western fabricators. Stimuli for this beautiful prospect is provided by plans already announced for government projects throughout the area; by plans on the drawing board of industries contemplating expansions or new facilities; and the need for hospitals, schools, offices and hotels to accommodate the growing population.

While private non-residential construction is of prime concern to steel producers and fabricators, residential housing on a large scale still affords an important market for steel products. In Los Angeles County last year, permits were issued for 67,212 units of privately financed residential construction and in the San Francisco-Oakland metropolitan area more than 20,000 units were start-

ed in 1949. Industrial expansions and new facilities in Los Angeles last year brought about investments of \$93 million and in northern California investments of more than \$100 million.

Market Analysts Optimistic

According to those who know—and this discounts sectional pride and rank optimism—there is every reason to believe that residential housing construction during 1950 will continue at as high a level this year as last and that both private non-residential construction and publicly financed construction will be at even higher levels. Perhaps some of the market analysts who made forecasts

of the production of bar shapes in the West for 1950 at a level 30 pct higher than last year and production of structurals at about 5 pct higher than 1949 gave some consideration to these optimistic factors.

In California about 50,000 persons are employed in the construction industry. Expressions made by authorities at Governor Earl Warren's conference on employment at the end of last year optimistically indicated that high levels would probably be maintained for the next several years. A gain of 84 pct in construction employment in California during the period from April, 1940, to April, 1949, was reported and in July of last year California with approximately 7 pct of the nation's population had about 8 pct of the total United State's construction employees.

Federal Grants Aid Fabricators

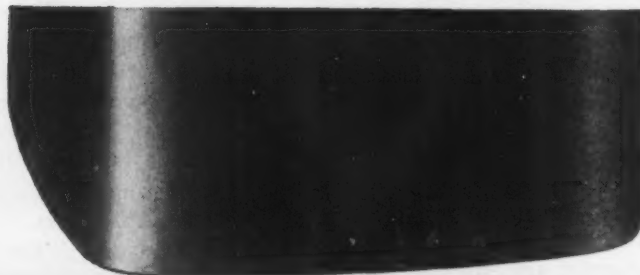
Steel fabricators in California are encouraged by Federal legislation which has made available about \$1 million to be used here in the planning of public works since this planning will make possible early actual construction. Five million dollars is also going to be made available during the fiscal year ending June, 1950, under the hospital survey and construction act. Recent legislation providing for the issuance of \$250 million for aid to distressed school districts and for construction of new facilities may upset earlier estimates that the state of California might spend less for public construction than during the year ending June, 1951.

Although it is generally con-

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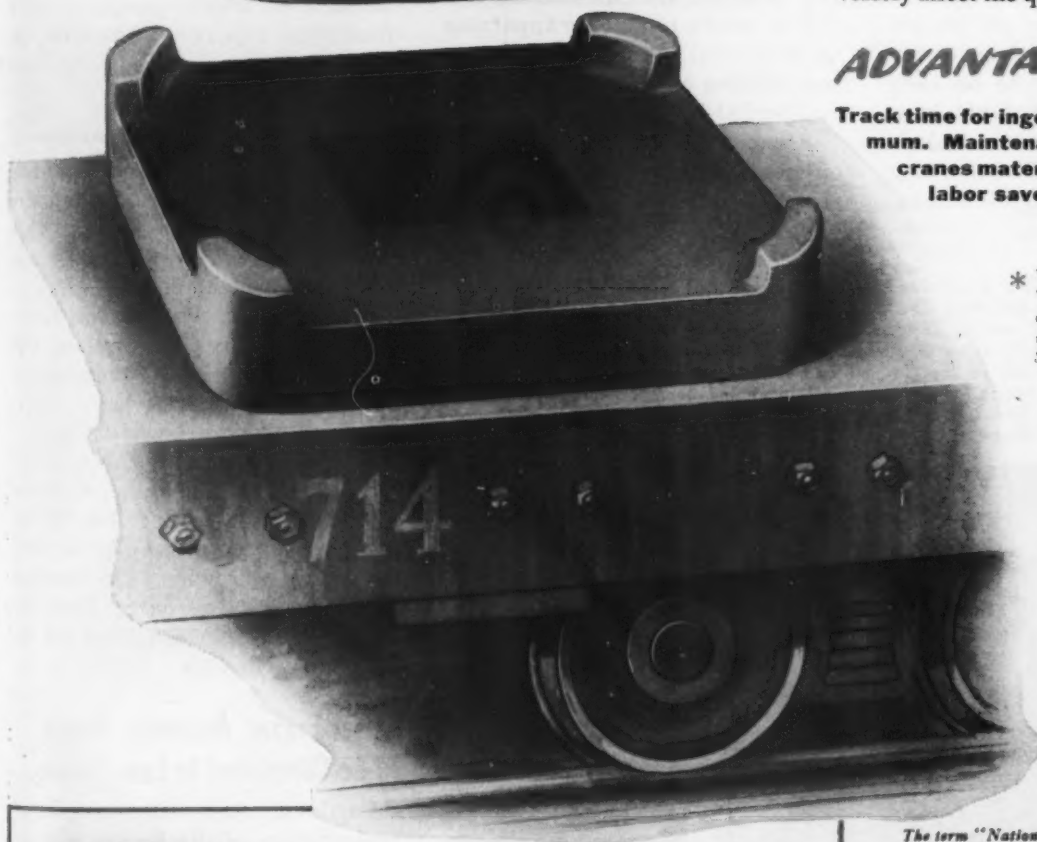


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* Write for free reprint of "Graphite Stool Inserts for Big-end-down Molds" from the September, 1949, issue of *Iron and Steel Engineer*. Address Dept. 1A.



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ceded that public works average about one-third of construction investments as a general rule, it is entirely reasonable to believe that heavy pressure exerted by rapidly expanding population will soon have its effect on private non-residential construction and that all in all 1950 should provide both steel producers and fabricators with a heavier tonnage volume but probably a lower net per ton. At least this is the thinking of many steel construction men.

Refrigerator Cars Ordered By Western Fruit Express

Seattle—Despite rumors to the contrary, Pacific Car & Foundry Co. is still in the business of building railway freight cars.

A contract has just been signed by the company for 460 new steel-sheeted refrigerator cars for the Western Fruit Express. Cars will have a load capacity of 100,000 lbs and are considered as 50-ton cars. Steel quantities to be used on this order have not yet been computed. Operations are scheduled to begin April 1. This job may overlap orders on hand for rebuilding cars.

DINNER GUESTS: Enjoying a pre-dinner conversation at last month's annual meeting of the San Francisco Bay Area Council are: seated, left, Walter Mathesius, president, Geneva Steel Co. and E. Gordon Fox, vice-president of Freyn Engineering Co.; standing, left to right, Alden G. Roach, president Columbia Steel Co.; William M. Hale, retiring chairman of the Council and executive vice-president American Trust Co., and Frank E. Marsh, executive vice-president and general manager of the Council. Following the dinner, Mr. Fox presented an analysis of Russian industry, economics and social problems.



Control Plan Lowers Salt Lake City Smoke Density

Salt Lake City—The smoke control program started by Salt Lake City ten years ago is still producing results, according to tests made this winter by W. L. Butler, chief engineer of the power and heating division.

Smoke density level has been running three pct below last year and is less than one-fifth as great as it was in 1940.

Solids in the atmosphere have been reduced to 17.1 pct of the 1940 level and light obstruction has dropped to 20 pct of the 1940 figure. This reduction has been accomplished during a period when consumption of all types of fuel has been steadily rising.

Program Has Two Main Phases

The two main phases of the control program are enforced correction of smoke producing apparatus in industrial plants and continuous policing of both industrial and residential heating plants.

A campaign against residential offenders this winter, Mr. Butler reported, resulted in the issuance of less than 100 warning notices.

Industrial plants are required by city ordinance to meet specified standards. Installation of hand-fired equipment in residences is prohibited unless the builder or owner signs an affidavit agreeing to burn only smokeless coal.

Good Year Forecast Despite Production Drop in Foundries

Los Angeles—Steel foundries are suffering their first real slump since the start of the war as they attempt to shift their business to compensate for the drop in castings needed for oil tools.

During 1949 the oil industry cut back on wildcat probing operations and oil tool companies were among the first to feel the effect. The drop is being felt now by steel castings manufacturers in southern California.

On an average, the drop is estimated at about one-third with foundries reporting business at that level as compared with last January.

Return to Post-War Markets

Gray iron foundries returned to post-war markets earlier than did the steelmen. Last year at this time, the gray iron industry reported a drop here.

Work for the 60 gray iron foundries in the area has leveled off, however, with most of them going at a steady pace, but below wartime and above pre-war levels.

Despite the drop at this time in steel casting business, most of the industry leaders expect 1950 to be a good year, picking up to be better than 1949 when the market trailed off in late months. They do not expect to reach a peak set in 1948, however.

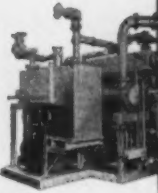
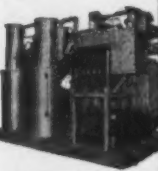


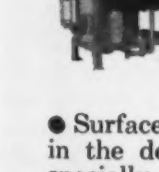
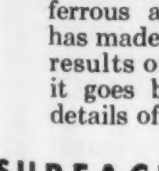
Kaiser-Frazer Assembly Plant To Be Completed in Late Spring

Portland, Ore.—Contracts for construction of the Kaiser-Frazer Corp. automobile assembly plant here have been let by the Union Pacific Railroad which is leasing the structure to the automobile builder. Cost is estimated at \$350,000 and completion is expected late next spring.

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TYPE OF GAS	* SIZES OF AVAILABLE UNITS	METAL TO BE TREATED				
		COPPER	LOW C. STEEL UP TO 0.20 C.	MED. C. STEEL 0.20-0.60 C.	HIGH C. STEEL ABOVE 0.60	SPECIAL STEELS
 DX GAS (LEAN) 40° F. DEW POINT	250 TO 35,000 CU. FT. PER HOUR	BRIGHT ANNEAL	—	—	—	—
 DX GAS (RICH) 40° F. DEW POINT	250 TO 35,000 CU. FT. PER HOUR	—	BRIGHT ANNEAL	UP TO 30 MIN. EXPOSURE BRIGHT ANNEAL AND CLEAN HARDEN	—	—
 NX GAS	1,000 TO 20,000 CU. FT. PER HOUR	BRIGHT ANNEAL	BRIGHT ANNEAL	BRIGHT ANNEAL CLEAN HARDEN	BRIGHT ANNEAL CLEAN HARDEN	—
 RX GAS	250 TO 3,500 CU. FT. PER HOUR	Oxygen, O ₂ , is the only one of the common gases which reacts with copper; consequently, the atmosphere generator may be dispensed with in the bright annealing of that metal. It is only necessary to set the furnace burners slightly rich to prevent free oxygen within the furnace.	CARBURIZE	CARBURIZE BRIGHT ANNEAL CLEAN HARDEN CARBON RESTORATION (SKIN RECOVERY) DRY CYANIDING	BRIGHT ANNEAL CLEAN HARDEN	—
 CHAR-MO GAS	500 TO 1,000 CU. FT. PER HOUR		CARBURIZE	CARBURIZE BRIGHT ANNEAL CLEAN HARDEN	BRIGHT ANNEAL CLEAN HARDEN	CLEAN HARDEN TUNGSTEN MOLYBDENUM STEEL
 AX GAS (DISSOCIATED AMMONIA)	500 TO 4,000 CU. FT. PER HOUR		—	—	—	BRIGHT ANNEAL STAINLESS STEEL

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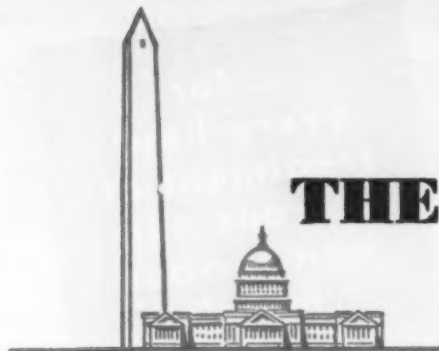
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February 9, 1950



THE FEDERAL VIEW

THIS WEEK IN WASHINGTON

Metallurgy important factor in atomic energy program . . .
Cost of building H-bomb open to speculation . . . FTC
Commissioners able to devote more time to cases.



by

Eugene J. Hardy

Washington—Speculation about the so-called hydrogen bomb has been flooding the news wires out of Washington. Covering such points as cost, time required to build it, and destructive force, all of it has been just that—speculation. On these points, THE IRON AGE knows no more than anyone else, but it does know that none of this speculation has any authoritative base in fact. For example, a 33-page transcript of last week's Atomic Energy Commission press conference reveals that some of the Nation's best reporters did their collective darndest to draw out Chairman Lilienthal and the other Commissioners on the subject of the H-bomb. What they got for their efforts could be written on the back of a postage stamp.

Misconceptions Need Clearing

While little can be said about details at this time, there are a few misconceptions which can be cleared up. These will not be denied by officials in the know. The first of these concerns the published reports that the H-bomb is a wholly destructive force with no possible

benefit to mankind resulting from its successful construction. While this may or may not be true if only the results of the explosion are considered, most scientists or technicians will admit that there not only may, but will be collateral benefits resulting from the construction of the H-bomb. Nowhere is this more probable than in the field of metallurgy. AEC in its most recent report to Congress emphatically stated that metallurgy "has become a field of vital import in the atomic energy program." There is no valid reason to anticipate that this statement will not also apply to the work required to complete the hydrogen bomb. What these possible collateral benefits might be, no one can tell at this time.

However, in its research in the field of reactor development, a collateral effect of the atomic bomb development, AEC has devoted intensive effort to perfecting metals and alloys that can perform adequately under the temperatures, pressures, and radiation to which they are exposed. AEC terms any success of reactor development at

nearly every point dependent on "improvements in available metals."

There is no good reason to believe that this work in metallurgy will not be of considerable value to the development of the H-bomb, and that conversely, work on this new weapon will not add to the store of knowledge along these lines. Much the same can be said regarding AEC's basic research program in metallurgy which includes the following lines of investigation: Strength of metals, diffusion in solid metals, thermo-dynamic research, corrosion, and affects of radiation.

Cost Estimates Vary

Another facet of the speculation about the H-bomb involves the cost in dollars. Varying reports have had this new weapon costing from as little as \$10 million to as much as \$4 billion. The fact is that no one will know what the cost will be until the bill is totaled after the job is completed. Requests for appropriations for the work will not reveal the total amount for they will be well hidden and certainly will not be identified as to purpose. The

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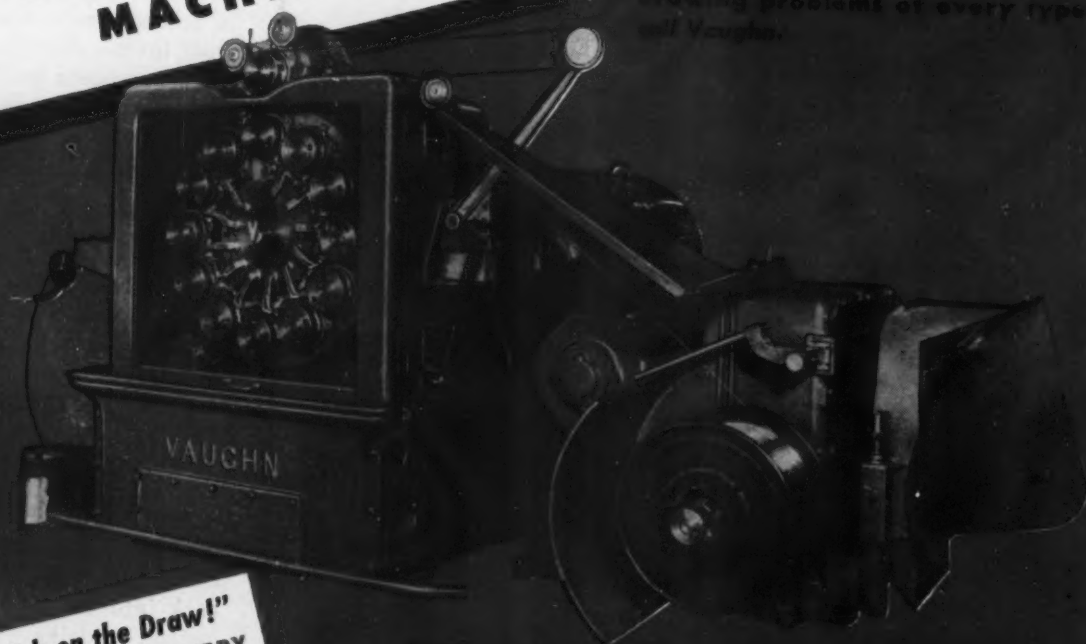
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only thing that can be said on this phase of the subject that is likely to hold up is that the project will not require anything like the 125,000 people employed at the peak of the construction effort on the first A-bomb, which cost \$2 billion.

There are some indications that cost might not be as great as is being imagined in some quarters. For example, AEC's report to Congress emphasizes that considerable research effort has been directed toward beryllium, lithium, helium and the isotopic forms of hydrogen. All of these materials, but principally tritium—the radioactive isotope of hydrogen, are basically important to the successful completion of the H-bomb. Progress to date on this research will have a direct bearing on the ultimate cost of the super-bomb.

FTC Is Dusting Out The Cobwebs Under New Acting Head

Several years ago this column termed the FTC as "that moribund mausoleum at the apex of the Federal Triangle." It was a fitting de-

scription. But today the crypts are being dusted out, and the cobwebs of fuzzy economic thinking are not growing quite as fast. Under the leadership of Acting Chairman Lowell Mason, whose picturesque speech was one of the few bright spots around FTC during the dark days, the Commission may once again occupy the position originally envisaged for it by Woodrow Wilson. Commissioner Mason attributes most of his success with new innovations to the new blood at the top level, Commissioners James Mead and John Carson.

In times past, the Commissioners passed on every minor detail, even such things as granting of leave to employees. All of these housekeeping duties have now been delegated to the secretary of the Commission. With their new-found extra time, the Commissioners are able to devote more attention to the cases brought before the Commission. Previously, cases brought before the Commission were presided over by the Chairman with other members rarely in attendance, and if they were, they knew nothing

about the case at hand. This was clearly indicated by the lack of questioning from the Commissioners.

Now there is a different presiding Commissioner at the various oral arguments, and he is fully informed of the facts of the case being heard, as are the other Commissioners. In the group of cases now being re-heard by the Commission, there is to be found a lively and responsive interest in the various arguments from both sides.

Commissioners Write Decisions

Another innovation involves the adjournment to a conference room at the close of oral argument where the Commissioners try to reach an immediate decision. Staff members are excluded from these meetings. A Commissioner now writes the decision rather than a staff member, whose interest in the case might be something less than impartial.

Clear lines of authority by which staff work can be brought to the attention of the Commission have also been established. In the past, staff members drifted around the various Commissioners' offices until they got enough votes to put over their point. Mr. Mason says that such "logrolling and office politics" are a thing of the past. This should do much to end the rather sorry spectacle of public bickering between various staff members which is nowhere more clearly indicated than in the controversy raging in the Commission on the steel industry's proposal to end FTC's price fixing charges.

Mr. Mason also implies that there will be no more long drawn out cases and trial records such as that resulting from the now famous Cement case. This could indicate that the Commission will approve some sort of negotiated settlement in the steel case, even if it is not exactly along the lines of the steel industry's current proposal.

All this is a hopeful sign for the future, but no one knows better than Commissioner Mason that extreme vigilance will be necessary if the Commission staff is not to lapse back into its old horse-and-buggy method of doing business.

THE BULL OF THE WOODS

By J. R. Williams



HOT SPOT

MACHINING

FOUND TO HAVE NO ILL EFFECTS ON
FINISHED PART METALLURGY

EXPERIMENTAL work on hot machining has been continued beyond that originally reported, resulting in a considerable amount of new data. The work of the past six months on Hot Spot machining by Sam Tour & Co., dealt with both mechanical and metallurgical factors. The metallurgical investigations dealt with metallographic and micro-hardness surveys of steel machined at temperatures of 72°, 600° to 700°, 1000° and 1450°F, and attempts to measure residual strain. Mechanical investigations consisted of additional cutting tests, experiments with high frequency power sources, induction coil design and the effects of tool design.

The metallurgical studies were conclusive. As part of the work authorized by the Navy Dept., Bureau of Ships, contract, a metallurgical study was made of four bars of heat treated Grade V steel. The bars, 3 in. diam x 20 in. long, were supplied by the New York Navy Yard, and were reported as having come from the same billet. The chemical analysis of the billet was reported as: C, 0.41; Mn, 0.81; P, 0.015; S, 0.028; Si, 0.25; Cr, 0.20; Ni, 3.39; and Mo, 0.06 pct.

The four bars were identified throughout the tests by numbers 8, 28, 38, and 19, respectively,

Microhardness surveys, microstructure examinations, surface analyses and Faxfilm replicas show that localized heating for machining has no detrimental effects on the hardness, surface condition and microstructure of finished parts. Studies were made on bars machined at room temperatures, 600° to 700°, 1000° and 1450°F.

By **L. T. FRIEDMAN**
Sam Tour & Co., Inc.,
New York



as shown in Table I. The object of the investigations was to establish the effect of the heat applied in Hot Spot machining on the hardness, surface condition and microstructure of finish machined parts.

TABLE I

MACHINING CONDITIONS

Bar No. →	8	28	38	19
Machining Temperature, °F.....	Room	600 to 700	1000	1450
Spindle Speed, Rpm.....	276	276	136	136
Feed, in. per Rev.....	0.006	0.006	0.024	0.024
Depth of Cut, in.....	0.200	0.200	0.250	0.250
Cutting Speed, Sfpm.....	216	216	106.5	106.5
Power Input, Hp.....	5.7	5.1	6.45	4.3
Metal Removal Rate, Cu in. per Min. per Hp.....	0.54	0.61	1.19	1.78

In the examinations of the bars, heated for machining by an induction coil powered from a 30-kw Tocco high frequency generator, a definite procedure was established that consisted of seven basic steps:

(1) Before machining, a hardness survey was made across a diameter of a 1/2 in. thick disk cut from the bar.

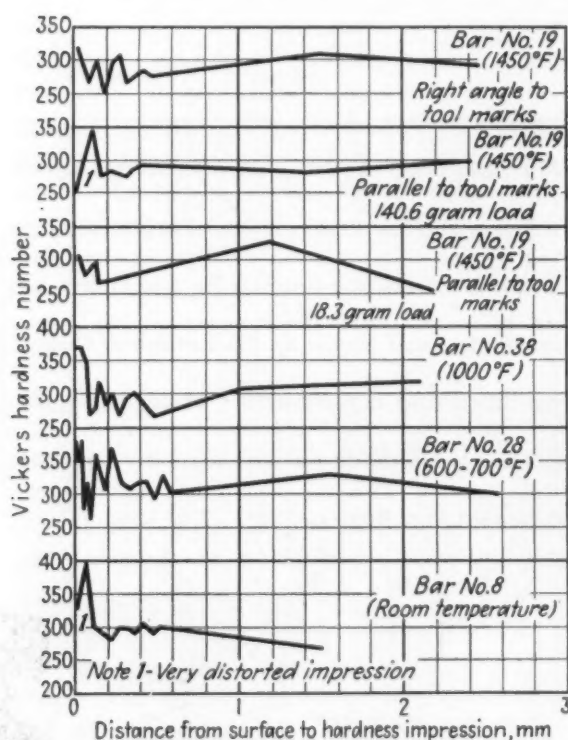


FIG. 1—Microhardness readings just below the machined surfaces of four test bars. An Eberbach Microhardness Tester was used with an 18.3 gr load on the indenter, with reading parallel to the tool marks.

(2) Before machining, a metallographic specimen was cut from this disk to determine the microstructure of the bar.

(3) After machining, a 1/2 in. thick disk was cut from the bar and a hardness survey was made across a diameter.

(4) After machining, metallographic specimens were cut from the center and the edge of the second disk. These specimens were nickel plated where necessary, mounted, polished and examined microscopically. Appropriate microphotographs were made.

(5) Faxfilm replicas were made of the machined surfaces of the bars. Hot Spot machining had left a thin but adherent blue oxide film that was removed prior to making the Faxfilm replicas by treatment with 10 pct sulfuric acid solution to which an inhibitor had been added.

(6) A microhardness survey was made in an area of the bar directly under the machined surface. The purpose of this survey was to determine hardness changes at the skin of the bar as a result of Hot Machining.

(7) A Brush Surface Analysis was made of the surface of the machined bars. The surface analysis was made in the direction of the tool marks.

Hot Machining Chronology

The major developments in hot machining, tracing back to when actual hot machining experiments were started, were described only in THE IRON AGE. These developments were described in the following articles:

"Hot Milling—Milling High Strength Alloys at Elevated Temperatures," by A. O. Schmidt, Kearney & Trecker Corp., Milwaukee. THE IRON AGE, Apr. 28, 1949, p. 66.

"Hot Spot Machining—At Work Temperatures of 500°, 1000°, and 1500°F," by Sam Tour and L. S. Fletcher, Sam Tour & Co., New York. THE IRON AGE, July 21, 1949, p. 78.

Progress reports on hot machining, in the nature of interim development information, were presented at the meeting of the American Society of Tool Engineers in Montreal, on Oct. 29, 1949. These reports consisted of two papers:

"Hot Milling Possibilities," by A. O. Schmidt and J. R. Roubik, Kearney & Trecker Corp., Milwaukee.

"Hot Spot Machining," by Sam Tour, Sam Tour & Co., New York.

Summaries of these papers were published in THE IRON AGE, Nov. 10, 1949, p. 94.

Other work of a collateral nature was shown in the bibliographies of the articles listed above.

Results of the hardness surveys across disks cut from the bars before and after machining are shown in Table II. The effect of Hot Spot machining is apparent from the data in this table, and are generally confined to very shallow depths below the machined surfaces. As temperature for machining is increased, it appears that the hardening caused by machining is less apparent. The average hardness for the bar machined at room temperature, bar 8, before and after machining, varies 0.8 Rockwell C hardness numbers. This amount is increased to a difference of 0.9 Rockwell C hardness numbers on bar 28.

On bars 38 and 19, machined at 1000° and 1450°F, respectively, the difference in hardness between machined and unmachined bars, on the average, amounted to only 0.1 Rockwell C hardness number.

To determine the effect of Hot Spot machining on the metal hardness directly below the machined surfaces, microhardness surveys were made. An Eberbach Microhardness Tester was used with an 18.3 gr load on the indenter on all bar tests. In addition, an examination was made on the specimen from bar 19 using a 140.6 gr load on the indenter, resulting in larger impressions.

TABLE II

HARDNESS READINGS

Tests Made Across Disks Cut from Bars Before and After Machining, Rockwell C Scale

Bar No. 8		Bar No. 28		Bar No. 38		Bar No. 19	
Before	After	Before	After	Before	After	Before	After
25	24	24	24	21	21	25	25
24	21	23.5	21	23.5	20.5	25	22.5
23	21.5	22	22.5	23.5	22.5	23.5	25
22.5	23	21	21	22	21	23	26
24	22.5	20.5	23	22.5	21.5	23	24
23	21.5	21	21	22.5	23.5	22	21
18*	21.5*	19*	19.5*	21*	23*	21*	21.5*
24.5	23.5	20.5	21	20	18	20.5	21.5
23.5	25	22	21	22	25	23.5	21.5
23.5	22.5	23	22	23	25	21	24
23	23.5	24.5	23	23	24	23	21.5
24	23.5	25	21	23.5	20	25	24.5
25	25	25	20	20	25.5	25.5	25
Avg. 23.3	22.5	22.4	21.5	22.1	22.2	23.1	23.0

* Center of Disk.

Specimens were mounted so that the surfaces on which impressions were made were approximately parallel to the tool marks on the machined surfaces. In addition, the specimen from bar 19 was remounted so that hardness impressions could be made on a surface at right angles to the tool marks on the machined surface, along a longitudinal section. The 18.3 gr load was used on the indenter. The results of these surveys are shown in Table III and graphically in Fig. 1.

TABLE III

MICROHARDNESS READINGS

Eberbach Microhardness Readings Below Machined Surfaces

Impression No.	Distance Below Surface, Mm	Vickers Hardness No.
Bar No. 8, 18.3 gr indenter load (Bar Machined at Room Temperature)		
1 (distorted)	0.0114	328
2	0.066	395
3	0.117	300
4	0.169	292
5	0.216	294
6	0.269	300
7	0.316	300
8	0.367	292
9	0.410	308
10	0.465	292
11	0.515	300
12	1.515	300

Impression No.	Distance Below Surface, Mm	Vickers Hardness No.
Bar 28, 18.3 gr indenter load (Bar Machined at 600° to 700°F)		
1	0.0114	382
2	0.029	348
3	0.037	382
4	0.051	278
5	0.060	294
6	0.063	318
7	0.076	300
8	0.096	281
9	0.139	358
10	0.188	308
11	0.234	370
12	0.288	318
13	0.333	308
14	0.385	318
15	0.439	318
16	0.485	292
17	0.535	328
18	0.583	300
19	1.583	328
20	2.583	300

Impression No.	Distance Below Surface, Mm	Vickers Hardness No.
Bar No. 38, 18.3 gr indenter load (Bar Machined at 1000°F)		
1*	0.014	370
2	0.041	370
3	0.067	348
4	0.094	289
5	0.119	278
6	0.145	318
7	0.166	294
8	0.231	300
9	0.273	289
10	0.318	292
11	0.358	300
12	0.402	292
13	0.446	276
14	0.488	289
15	1.3 approx.	308
16	2.1 approx.	318

Impression No.	Distance Below Surface, Mm	Vickers Hardness No.
Bar No. 19, 18.3 gr indenter load (Bar Machined at 1450°F)		
1*	0.016	308
2	0.063	276
3	0.107	292
4	0.136	300
5	0.148	269
6	0.190	269
7	1.190	328
8	2.190	254

Impression No.	Distance Below Surface, Mm	Vickers Hardness No.
Bar No. 19, 140.6 gr indenter load, large impression (Bar Machined at 1450°F)		
1 (distorted)	0.018	254
2	0.068	314
3	0.118	350
4	0.168	278
5	0.218	294
6	0.318	275
7	0.358	296
8	0.418	293
9	1.418	281
10	2.418	298

Impression No.	Distance Below Surface, Mm	Vickers Hardness No.
Bar No. 19, 18.3 gr indenter load, longitudinal section (Bar Machined at 1450°F)		
1*	0.029	318
2	0.057	300
3	0.104	289
4	0.148	300
5	0.197	254
6	0.241	292
7	0.288	308
8	0.324	289
9	0.392	276
10	0.427	284
11	0.472	276
12	1.472	308
13	2.472	292

* Impression in region of changed structure.

From a study of table III and fig.1, it can be seen that in all four bars, some hardening occurred directly beneath the machined surfaces. The depth of this hardening is no more than about 0.5 mm, except as noted in bar 19. A hardness of 328 Vhn at a depth of 1.190 mm was noted, apparently the result of an experimental error or a hard spot, since the readings taken above and below this check point compare well with each other and are both softer than 328 Vhn.

In the data shown in Table IV, it is shown that the maximum hardness is found in the case of bar 8, which was machined at room temperature, although from Table II it can be seen that all four bars have similar hardnesses as determined across the face of the disk taken

TABLE IV

HARDNESS DATA

Maximum and Average Hardness Data on
Machined Bars, Vickers Hardness Numbers

Bar No. and Machining Temperature	A Maximum Hardness and Depth at Which Reading was Obtained	B Average of Hardnesses Taken Beyond 1 Mm Depth	C Difference Between A and B
8 Room Temp.	395 (0.066 mm)	300 (1.515 mm)	95
28 600° to 700°F	382 (0.037 mm)	314 (1.583 and 2.583 mm)	68
38 1000°F	370 (0.041 mm)	313 (1.3 and 2.1 mm)	57
19 * 1450°F	308 (0.016 mm)	291 (1.190 and 2.190 mm)	17
**	350 (0.118 mm)	290 (1.418 and 2.418 mm)	60
***	318 (0.029 mm)	300 (1.472 and 2.472 mm)	18

*— 18.3 gr load, parallel to tool marks.
**— 140.6 gr load, parallel to tool marks.
***— 18.3 gr load, right angles to tool marks.

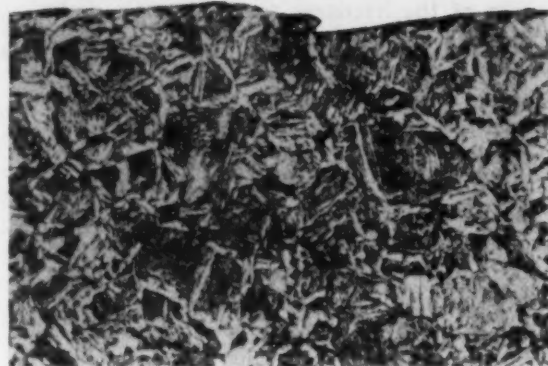


FIG. 2—Bar 8 machined at room temperature, shows tearing but no surface distortion of the microstructure. Work hardening of the surface was caused by the inability of the metal to plastically deform under machining stresses. (500X).



FIG. 3—Bar 28, machined at 600° to 700°F shows plastic deformation. (500X).

from the machined bar. Furthermore, from Table IV, it is evident that the difference between the maximum hardness at the surface and the hardness reading taken at a depth where the original condition is not modified by machining

Further Hot Machining Tests

New cutting tests have confirmed previous findings that heating materially aids in cutting steel. As-rolled Inconel X was one of the new materials tested, and additional cutting tests on S-816, a high temperature-service alloy, gave metal removal rates up to 9 cu. in. per min. In the latter case, cratering of the tool was encountered quickly.

No work has been done to determine optimum tool materials, since the first tool failure encountered was in machining S-816 at the rates indicated. A limited number of experiments were made with different tool designs, varying rakes and clearance angles. Apparently tool form has an effect of lesser magnitude than originally anticipated.

Previous work reported was based on heating with an Ecco spark gap, high frequency converter. A 30-kw Tocco motor generator was subsequently tried. To reduce line losses, a substation was mounted on the lathe. A new type single turn coil encased in U-shaped, transformer-steel laminations was developed.

From a practical standpoint, commercial high frequency generators of any frequency can be successfully used in hot machining. Indications are that there is still much improvement possible in coil design. Split coils, partial coils, combination coils, flux concentrators and coil size should be studied to obtain best results.

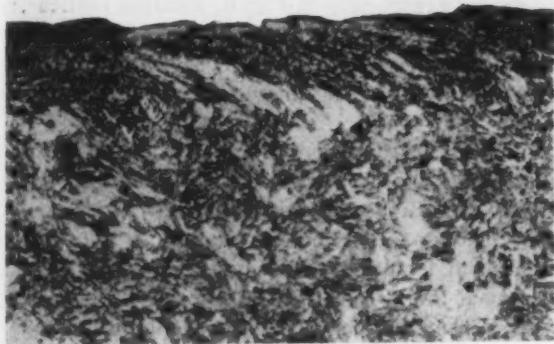


FIG. 4—Bar 38, machined at 1000°F shows greater plastic deformation than bar 28, and evidence of grain recrystallization at the skin. (500X).

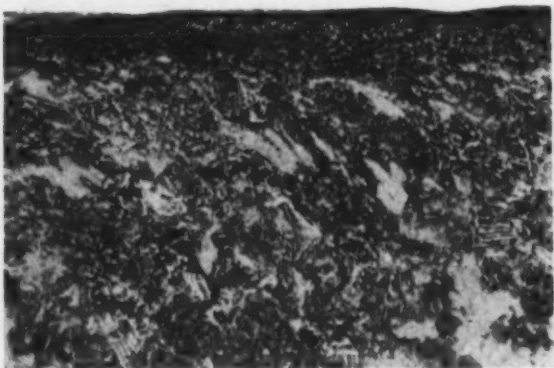


FIG. 5—Bar 19, machined at 1450°F, shows the greatest amount of plastic deformation and increased grain recrystallization at the skin. Increased ductility permitted plastic deformation in the work machined at higher temperature and reduced the amount of work hardening. (500X).

(more than 1 mm), is again at maximum for room temperature machining.

The depth of work hardening after machining is of the order of not more than 1 mm, and is more generally confined to a depth of several tenths of a millimeter. The higher hardness of metal directly below the machined surface, as compared to the core metal, is at a maximum for room temperature machining and decreases as the machining temperature increases.

Discrepancies in these conclusions were noted in the case of bar 19, using an indenter load of 140.6 gr, which may have been the result of an error in calibrating the spring of the Eberbach Microhardness Tester.

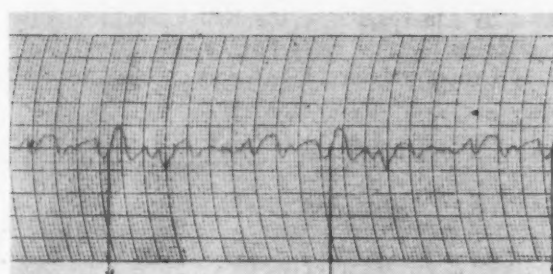
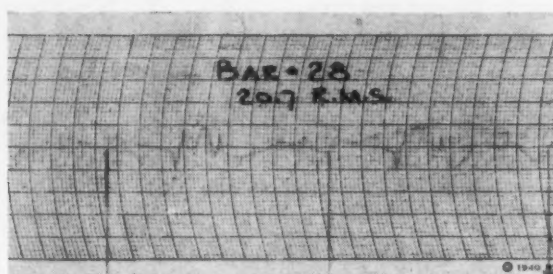
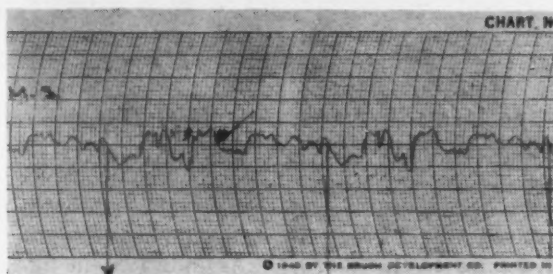
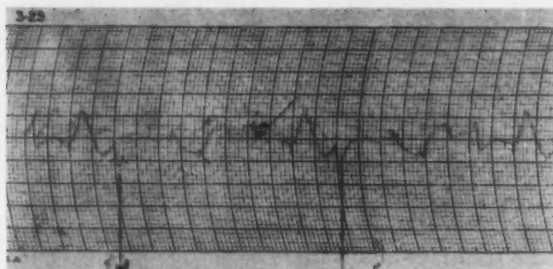


FIG. 6—Brush Surface Analyzer examination showed the following values: Bar 8, 18.4 rms; bar 28, 20.7 rms; bar 38, 16.1 rms; bar 19, 13.3 microinches rms.

A second determination made with an 18.3 gr load on the indenter on a face at right angles to the tool marks gave a good check of results

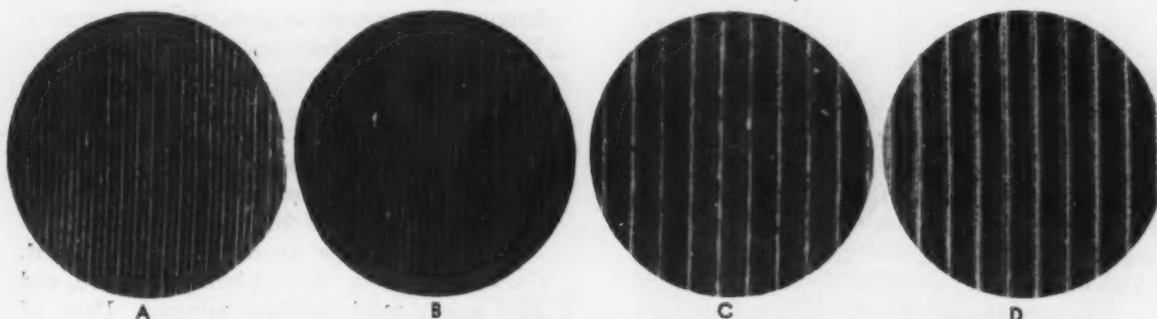


FIG. 7—Faxfilm replicas for four test bars show that surfaces after high temperature machining are at least as good as those after normal machining. A shows bar 8, B shows bar 28, C shows bar 38 and D shows bar 19. Bars 38 and 19 show evidence of heavier feeds than those used in bars 8 and 28.

on readings made parallel to the tool marks using the same 18.3 gr load.

The microstructure of machined bars near the surface shows increasing plastic deformation and grain recrystallization with increasing temperature of machining. The depth of deformation is about 0.1 mm. These microstructures after machining are in general agreement with the hardness findings.

Fig. 2, showing bar 8 after machining, shows no surface distortion of the microstructure. The inability of the metal to deform plastically at room temperature under machining stresses involved would result in a maximum of work hardening of the surface. As indicated in fig. 1 and Table III, however, hardening drops off rapidly toward the core.

Figs. 3, 4, and 5, showing bar 28 machined at 600° to 700°F, bar 38 machined at 1000°F, and bar 19 machined at 1450°F, respectively, show increasing amounts of plastic deformation at the surface. In the case of bars 38 and 19, grain recrystallization occurred at the skin. The increased ductility at the higher machining temperatures permitted more plastic deformation and less work hardening.

Surface condition of machined bars was compared by the results of the Brush Surface Analysis: Bar 8, 18.4 rms; bar 28, 20.7 rms; bar 38, 16.1 rms; and bar 19, 13.3 rms. These results

are shown graphically in Fig. 6. Faxfilm replicas, Fig. 7, show the higher feed rates used in machining bars 19 and 38, 0.024 in. per rev, as compared to those used in machining bars 8 and 28, 0.006 in. per rev.

From a consideration of the surface analysis results and the appearance of the Faxfilm, the surface conditions resulting from high temperature machining are better than those obtained from room temperature machining. Except for the out-of-line value for the rms of bar 28, it would appear that the surface condition improves with increased temperature of machining. Furthermore, the chatter marks noted in the case of bar 28 would suggest unfavorable machining conditions that might account for the poorer surface condition of that bar. In connection with surface condition, it is interesting to note the ragged appearance of the surface profile of bar 8, machined at room temperature, as shown in Figs. 2 and 7a.

Residual stress examinations were far from conclusive. The findings were erratic, confusing and impossible of explanation. It was apparent that some outside influence had been encountered, but it has not yet been determined whether the testing technique introduced variables or the machined finish applied to the bars at the material source left them with a considerable amount of surface stress. It is known that the Navy Yard, which supplied the bars, took both a heavy roughing and a light finishing cut on each bar. Considerably more work must be done on the study of residual stresses before any conclusions can be reached.

NEW BOOKS

"Outline for Pension Planning." A group of 12 articles that offer a practical guide to the problems involved in establishing a company pension plan. The articles describe steps to be taken in preliminary procedure, types of higher social security demands, various demands to make in bargaining, and the effects of pension fund accumulations on the investment market. Journal of Commerce, 63 Park Row, New York 15. 15¢. 16 p.

* * *

"The Science of Wrinkle Finishing," by W. A. Waldie. Book tells what the formulator must do to produce a soft, suede-like finish, or a high metallic gloss. Preparation of surface, spraying, drying and baking are fully described, and application to flexible materials such as paper, fabrics and wood are dealt with. Technical data on polymerization and on drying oils are given special attention. Research Press, Inc., 137 N. Perry St., Dayton. \$5.00. 200 p.

"Repertorio delle Industrie Siderurgiche Italiane" (Repertory of Italian Iron and Steel Industries). Book gives an extensive review of Italian firms engaged in primary and secondary production of iron and steel. Descriptions, dimensions and quality of products manufactured by these concerns are given, and the volume contains conversion tables of measures, along with an iron and steel dictionary in five languages. Associazione Industrie Siderurgiche Italiane (Italian Iron and Steel Federation), Piazza Rugabella N. 13, Milano, Italia. \$5.50.

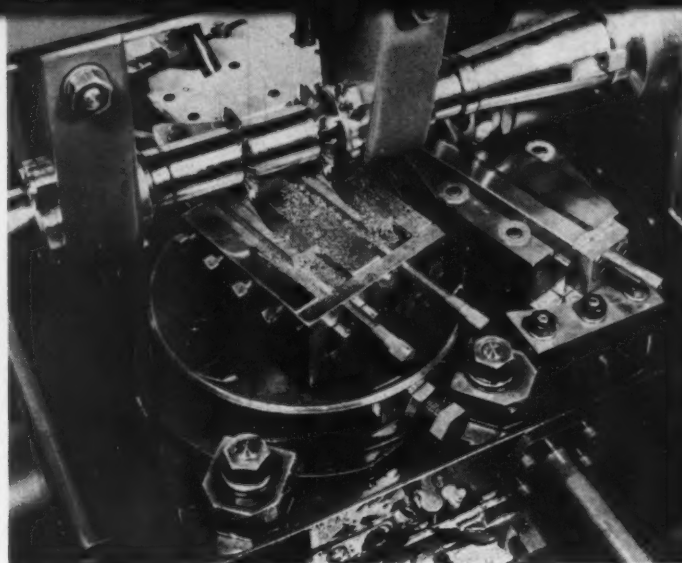
* * *

"Economics of the Mineral Industry," contains all the papers presented at the general conference on that subject. Included are discussions of mineral-resource appraisal by the U. S. Geological Survey, oil and human welfare, and gold as our most strategic mineral. Dept. of Publications, Colorado School of Mines, Golden, Colo. 50¢. 47 p.

FIG. 1—Two dies for rolling threads in TWINfast wood screws are shown being milled simultaneously.



By THOMAS E. LLOYD
Machinery Editor, *The Iron Age*



Lower Cost Milling Of Thread Rolling Dies

Unique milling machine setup automatically makes accurate dies for rolling wood screws

WHEN the Blake & Johnson Co., Waterville, Conn., was developing the TWINfast* wood screw under patents of the New Process Screw Corp., one of the major problems was the production of accurate thread rolling dies at reasonable costs. Such dies must be extremely accurate and have a fine finish on the sides of the threads, and the manufacture of satisfactory dies always had been a long and tedious process.

After a thorough investigation, Cincinnati Milling & Grinding Machine Co., Cincinnati, developed a die milling machine with the necessary special attachments to produce automatically a satisfactory humped die. Dies up

* Registered, U. S. Patent Office

to 8 in. long x 4 in. projected width can be milled, and in milling small dies, as many as four can be machined simultaneously.

The TWINfast screw provides twin threads

which spiral the root from opposite sides, resulting in a thread pitch approximately twice as great as that of ordinary screws. This permits, with a single turn of the screw driver, reducing the driving time and reducing the friction and wear of threads cut by the screw. The screw is cylindrical, not tapered from head to toe, and has a single, centered point formed by the meeting of the twin threads at the axial center of the screw.

In fig. 1, dies shown are 3 in. long and two are being milled simultaneously. The fixture is stationary in this setup, but it is planned that in the future the fixtures will be supplied with a gib arrangement under each workpiece to compensate for cutter sharpening.

Heretofore, it has been a part of the operator's duties to manually index forward the saddle or the work holding fixture a predeter-



FIG. 2—A template that imparts the thread form to the dies is located immediately behind the workholding fixture. In the foreground is a master feed cam that serves to cut down idle or noncutting time in the machining cycle.

mined amount from one thread to the next. This had to be accurate so as to obtain the correct pitch in the dies. Also, it usually has been necessary to shift the master template at the completion of the milling of each thread because in milling the die blanks they are set on an angle to the longitudinal movement of the table. Consequently, the thread starts at a different place each time. This shift has been done by means of gage blocks.

On the new machines, there is an automatic pickfeed arrangement similar to that used on Cincinnati grinders, whereby the fixture is shuttled forward a predetermined amount from one thread to the next. The amount of shuttle is infinitely variable from 0 to $\frac{1}{8}$ in., and the accuracy of this index is 0.0005 in. This accuracy can be increased to 0.0003 in. by using three pickfeed pawls rather than two, as supplied on this machine.

The master template is located immediately behind the workholding fixture, shown in fig. 2. The form on the top surface of the template conforms to the root surface of the threads to be produced in the dies. The master is set on the same angle as the work, and as the work is indexed from thread to thread, the master follows the same path of index.



FIG. 3—The machine on which this special equipment for milling thread rolling dies has been placed is basically a Cincinnati 0/8 automatic rise and fall miller. The machining cycle is automatic, milling proceeding until the entire die is completely milled.

The master template conforming to the root depth of the threads, over which the roller rides, has a vertical adjustment of about $\frac{1}{8}$ in. Future machines will be built to eliminate this $\frac{1}{8}$ in. adjustment, and carry the adjustment of about 1 in. on the roller itself.

In the foreground of fig. 2, on the left of the machine table is a master feed cam arrangement that serves to cut down the idle feed time. Three such cams are supplied with the machine, one being 8 in. long, one 5 in. long and one 3 in. long. All are adjustable for width.

Overtravel Cam Control

These cams permit only a minimum of approach and a minimum of overtravel of the cutter relative to the thread. Because the threads are milled on an angle to the die block, one thread may be only $\frac{1}{4}$ in. long and for this thread the table will feed about $\frac{1}{2}$ in. On a 3-in. die, a thread may be up to $3\frac{1}{4}$ in. long, and the table will automatically feed approximately $3\frac{1}{2}$ in. for this thread. In other words, the table will feed no further than necessary for milling any specific thread.

The machine on which this special equipment has been placed is basically a Cincinnati 0/8 automatic rise and fall miller with special details. The first of these is a special, very heavy overarm, as can be seen in fig. 3. The cabinet base is larger than standard, the bearing guides on the spindle carrier are increased in length by 6 in., and the arbor and the cam roller attachment are of special design.

The machining cycle is started by the table start button on the right front of the machine. This starts the table on rapid advance, the spindle carrier feeds down until the roller contacts the master cam when the table begins to feed. At the completion of the first thread, a limit switch is contacted that operates a solenoid, which in turn kicks over the cam cycle assembly of the machine. The spindle carrier then rapid traverses back to its starting position, and the table rapid traverses back an amount determined by the master feed cam.

As the table is rapid traversing back, the fixture automatically indexes forward from the first thread to the position for milling the second thread. When the table has rapid traversed back to its correct position as determined by the master feed cam, the carrier will lower and the machine will again begin in feed milling the second thread. The cycle will be repetitive until the last thread has been cut, at which time the machine automatically stops. The operator can then return the work holding fixture back to its starting position by means of a large hand wheel at the front of the machine. The backlash is taken out of the screw and the workpieces removed from the fixture, and unmilled ones put in the places.



Courtesy Mexico Refractories.

Better Mold Liners

for Dry Pressing Brick



By **ROY D. HAWORTH**
Armour Research Foundation
Chicago

Results of extensive field and laboratory tests of steels for mold liner use. Cast v. rolled comparisons included. High C, High Cr and a modified High Speed Steel are the best materials.

THE rapid wear of the mold liners in the mechanical pressing of refractory brick is one of the more severe abrasion problems encountered by modern industry. In one plant only 15,000 to 30,000 silica brick can be produced before it is necessary to recondition the highly-abrasion-resistant alloy steel liners. In addition to the initial cost of the liners, maintenance and lost production time involve considerable expense.

Recognizing the severity of the problem, Chisholm, Boyd & White Company of Chicago, manufacturers of the "Boyd Press" on which most of the dry-press refractory brick in the country are made, initiated a project at Armour Research Foundation to determine the best and most economical mold liner materials.

About 75 different selected materials and

heat treatments were investigated. These included recently developed high speed steels, high-carbon high-chromium steels, cast alloys, white irons, tungsten carbide and sintered aluminum oxide. Only the most promising materials, on the basis of laboratory tests, were subjected to the more time-consuming field tests.

Laboratory tests were made on an abrasion testing machine consisting essentially of a rotating rubber wheel which carries loose abrasive against a stationary test specimen. The specimen size was 3 x 1 x 1/2 in. A schematic diagram of the machine's method of operation is shown in Fig. 1 and a high-speed photograph of the machine in action with an abrasive slurry may be seen in Fig. 2. Accumulation of data showed that sufficient correlation exists between the laboratory and the field tests.

Field tests were conducted in a modern refractory plant in a Boyd "Model X" four-mold press used for the commercial production of straight 9-in. silica brick. The tests were confined to the side liners, which in this operation measured $8\frac{1}{2} \times 10\frac{3}{4} \times \frac{3}{8}$ in.

In the field tests of the mold liners, wear was expressed in terms of weight loss in grams per 1000 bricks produced. Because the operating conditions in each mold were essentially identical, as many as four different materials can be evaluated in duplicate by making the two side liners in each mold of the same material. Each test was continued until the poorest wearing material required replacement. All of the liners were then removed and the weight losses determined. A mechanical counter recorded the number of strokes made during the tests. All tests were made under close technical supervision on the same press and under identical operating conditions.

A pair of rolled high-carbon high-chromium steel liners was included in each test as a control standard. The control liners were placed in different mold positions during the tests in order to check the uniformity of wear from one position to another.

The weight losses of ten control liners were found to range from 2.0 to 3.0 g per 1000 bricks with an average of 2.5 g. The low and high values were not confined to specific mold positions. The control liners were taken from stock and may have been made from two or more steel heats.

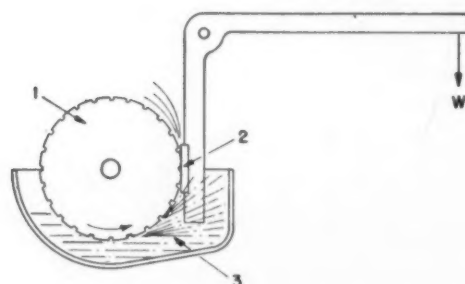


FIG. 1—Schematic diagram of laboratory abrasion testing machine used in the investigation. 1—rubber wheel, 2—specimen, 3—loose abrasive.

The laboratory and field tests, with the exception of tungsten carbide liners which are still being tested, showed no material better than a selected, rolled, high-carbon high-chromium alloy steel. However, maximum performance can be assured only by complete removal of mill decarburization and by correct heat treatment. The normal microstructure of this alloy is shown in Fig. 3.

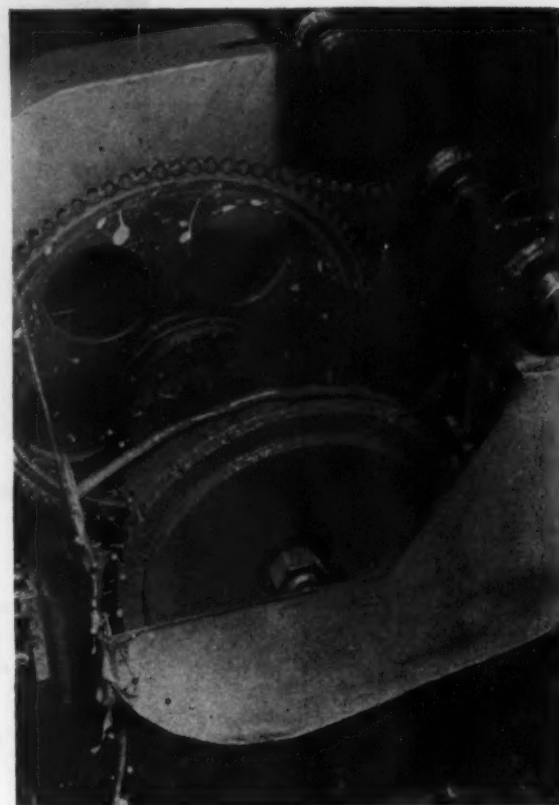


FIG. 2—High-speed photograph of abrasion testing machine in action with an abrasive slurry.

A similar rolled alloy containing 4 pct vanadium showed no better performance than the high-carbon high-chromium steel. The high vanadium content did not appear to be of any value for this low speed application.

Cast alloy liners have advantages over high-alloy rolled steels in lower material cost and elimination of the heat treating operation, but these savings may be more than offset by the necessity of excessive grinding to insure clean, sound liners. A cost study of the relative economics of cast v. rolled alloys is being made by the manufacturer.

Tests on two cast liners with the following analyses:

	Chrome Iron	Chrome Molybdenum Iron
Carbon	2.64	2.64
Silicon	0.33	1.38
Chromium	23.40	15.52
Molybdenum		2.34

are interesting in emphasizing the lack of direct correlation between hardness and liner performance. The carbon contents were identical, yet the high-chromium alloy with a hardness of Rc 62 to 63 wore four times faster than the lower chromium alloy with a hardness of only Rc 51.

Sintered tungsten carbide liners have found

limited application. Field tests indicate that their use is economically feasible for brick sizes involving large production runs. The initial cost is high and the liners must be carefully handled. Liner holders of special design and high precision are required in order to avoid breakage in service.

Boron carbide and sintered aluminum oxide, which have been tested in the laboratory, also may be potential liner materials. Because of their inherent brittleness, breakage in handling and in service might be a serious problem. The cost of aluminum oxide liners would be lower than tungsten carbide but the service life would be shorter.

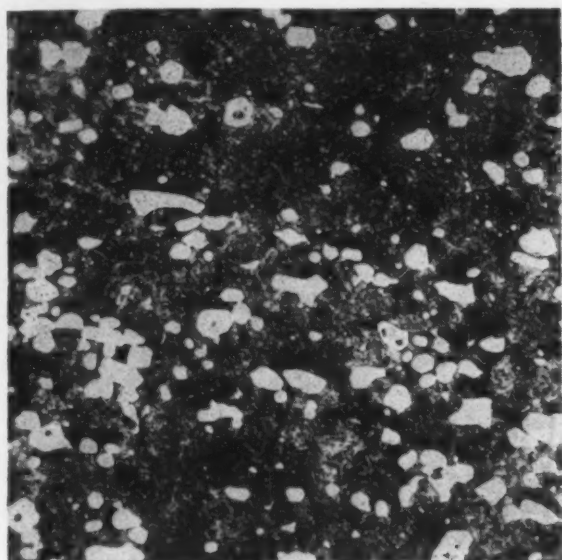


FIG. 3—The normal microstructure of a high-carbon high-chromium steel liner. 250X. Etchant—Vilella's reagent.

Observations in the field developed certain facts which are important in appraising mold liner service. For instance, basing relative performance alone on the number of bricks produced before the liners are considered worn out can produce misleading conclusions. The liners are considered worn out when, in the operator's judgment, excessive fins are formed on the bricks. However, the operator's judgment will vary considerably from time to time as to the point when wear on the liners no longer makes them serviceable. Differences in performance cannot be evaluated strictly on the basis of the number of bricks produced except by statistical analysis, which would require a large number of tests.

Decarburization can seriously affect the performance of inherently good liner materials. For example, one high-carbon high-chromium steel liner showed a weight loss of 4.5 g per 1000. Its hardness was RC 62 to 63. The liner was reground, resulting in a hardness of RC

64 to 65 and a weight loss upon retesting of 3.0 g per 1000. The amount of partial decarburization was probably not over 0.010 in., but the effect on the initial liner performance was marked. The value of 4.5 was not included in the range of values previously mentioned for high-carbon high-chromium steel because of the pronounced decarburization present.

Improper heat treatment likewise can impair the performance of good steel. A high-vanadium alloy showed a hardness of RC 56 to 59 after air cooling from 1850°F and RC 64.5 to 65.5 and tempering at 300°F, after similar heat treatment at 1950°F. The weight loss decreased from 7.1-8.4 g per 1000 bricks at the lower hardness to 2.8 g at the higher hardness.

Unsoundness and improper microstructure can seriously affect the performance of cast alloys. One of the objections to the use of cast liners is the lack of consistent soundness. A nickel-chromium white iron was satisfactory in chemical analysis, but low in hardness (RC 44 to 48). This material, which showed a weight loss of 28.5 g per 1000, was broken after testing and found to be badly mottled. The microstructure, fig. 4, contained much primary graphite. Otherwise the structure was similar to normal nickel-chromium white iron RC 56 to 58, which exhibited lower and consistent weight losses (5.3 g per 1000).

Consideration of the abrasive characteristics of refractory materials can be limited to fire clay, silica, magnesite and chromite because these represent almost the entire production of refractory brick.

The raw material for silica brick is produced by crushing essentially pure quartzite rock resulting in an angular and highly abrasive product known as ganister. Chromite, a member of the spinel group, containing aluminum oxide



FIG. 4—A poorly abrasion resistant structure of a Cr-Ni iron liner, showing a large amount of primary graphite. 250X. Etchant—Nital.

varying in content from 10 to 30 pct, is hard and similarly angular, and therefore may be even more abrasive than ganister. Fire clay and dead-burnt magnesite are usually finer and/or softer than ganister—hence, less abrasive.

Laboratory abrasion tests were conducted on two different steels to determine the relative abrasiveness of quartzite, chromite and magnesite (Table I).

TABLE I
Relative Abrasiveness of Refractory Materials

Wet laboratory tests; 28 to 35 mesh particles; speed 600 fpm;
60 psi load; 4000 ft test distance

Steel	Rockwell C Hardness	Average Weight Loss (grams x 10)		
		Quartzite	Chromite	Magnesite
SAE 1095.....	65 to 66	44.5	66.0	6.7
12Cr-2.2C.....	60 to 61	3.8	6.8	0.9

The chromite was about one and a half times more abrasive than the quartzite, which, in turn, was several times more abrasive than the dead-burnt magnesite.

At the beginning of the investigation, insufficient reliable field test data were available to ascertain the extent of correlation between laboratory and service results. The speed of the brick pressing operation is less than 25 fpm, and operating pressures range between 1500 and 5000 psi. In contrast, a speed of 60 fpm, and a pressure of 180 psi are, respectively, the lowest speed and the highest pressure under which the laboratory tests can be run. Therefore, some discrepancy may be expected between the results of these laboratory tests and field performance. Hence, final conclusions were based only on field tests.

To evaluate the effects of speed and pressure, laboratory tests were conducted at 60 and 600 fpm and 60 and 180 psi. At the heavier load, rubber wheels were used that had about 1/3 the elasticity of those used at the lighter pressure. The contact areas between wheel and specimen, therefore, were approximately the same at both pressures and the results could be compared directly (Table II). Worn laboratory test specimens illustrating the effect of pressure on fully-hardened SAE 1045 steel are shown in Fig. 5.

At the same pressure, the weight loss of each material in the higher-speed test was greater than that at the lower speed except the Ni-Cr iron at the lower pressure. Resistance to abrasion was in a different order in the higher-speed than in the lower-speed tests. At the higher

speed, for example, the weight loss of the modified high speed steel was considerably less than that of the high-carbon high-chromium steel, whereas at the lower speed the reverse was true. The modified high speed steel contained 1.47 C, 4.31 Cr, 2.57 Mo, 4.19 V and 3.30 W.

TABLE II
Effects of Speed and Pressure on Abrasion Resistance

28 to 35 Mesh Wet Quartzite; 4000 ft Test Distance

Steel	Rockwell C Hardness	Average Weight Loss (grams x 10)			
		60 fpm		600 fpm	
		60 psi	180 psi	60 psi	180 psi
SAE 1045.....	59 to 61	24.5	122	41.0	241
SAE 1095.....	61 to 62	14.4	97.9	44.5	178
12Cr-2.20-C.....	63.5 to 65	1.2	7.3	3.4	44.0
Modified high speed.....	61 to 63	1.5	12.4	2.1	18.0
Ni-Cr iron.....	56 to 58	4.3	22.2	3.3	23.0
High-Cr iron.....	62 to 63	1.6	15.2	9.4	64.0

The field test results showed poor correlation with the higher-speed laboratory tests at both pressures, but the results of the lower-speed, higher-pressure tests were essentially in the same order as the service values. The specimens used to determine the effects of speed and pressure on abrasion resistance were cut from the worn liners used to obtain the field data. Therefore, correlation of results was not affected by possible differences in analysis or microstructure between the test specimen and liners. The test is felt to be sufficiently reliable to indicate alloys that warrant the additional expense of field testing.

TABLE III
Effect of Grain Size on Abrasion Resistance

Wet Quartzite; 600 fpm; 4000 ft Test Distance

Steel	Rockwell C Hardness	Average Weight Loss (grams x 10)			
		28 to 35 Mesh		65 to 100 Mesh	
		60 psi	180 psi	60 psi	180 psi
SAE 1045.....	59 to 61	41.0	241	15.2	60.5
SAE 1095.....	61 to 62	44.5	178	13.7	52.6
12Cr-2.20C.....	60 to 61	3.8	55.0	1.1	3.0
Modified high speed.....	61 to 64	2.1	18.0	0.3	1.8

Another variable which could affect the correlation of laboratory and field test results is the grain size of the refractory materials. The grain size distribution of the materials used in the production of commercial silica brick ranges from plus 10 mesh to minus 100 mesh.

In the laboratory tests, it has been found

necessary to use a narrow range of grain size in order to insure reproducibility of results. The relative abrasiveness of 28 to 35 v. 65 to 100 mesh quartzite grains at pressures of 60 and 180 psi is illustrated in Table III.

Although sharply reflected in lower abrasiveness, the finer grain size did not affect the order of performance of the materials tested. However, in the higher-pressure tests, the superiority of the alloy over the carbon steels was greater with the finer abrasive. The greater abrasiveness of the coarser grain size is ascribed to the higher pressures on the individual grains. The higher pressures apparently contributed more to abrasiveness than the larger number of cutting points of the finer material.

Other materials and heat treatments are being investigated and tested for Chisholm, Boyd and White Company in the search for superior and more economical liners. Included

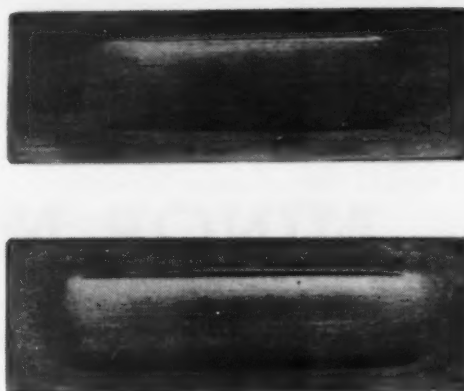


FIG. 5—Effect of pressure on fully hardened SAE 1045 steel specimen. Abrasive-wet quartzite. Speed—60 fpm. Above—60 psi; weight loss—24.5. Below—180 psi; weight loss—122.

is the effect of cold treatment on alloy tool steels. Results of interest and value will be embodied in a subsequent article.

Corrosion Resistance Treatment For Zinc Die Castings

ZINC die castings are given a chemical corrosion resistance treatment at Easy Washing Machine Corp., Syracuse, N. Y., which not only increases resistance to surface corrosion, but also serves as a good preparation for enameling. Treatment is fairly rapid, accomplished by immersion of the castings in a series of tanks served by electric trolley hoists for handling the work baskets.

Castings are first cleaned in a solution containing $\frac{1}{2}$ lb per gal of Clepo No. 166. The solution is kept at 190°F, and castings are given a 35-sec dip, which proves ample for cleaning. A dip in running water follows immediately, after which the castings are immersed for 5 to 10 sec in a 2 pct sulfuric acid solution to neutralize any alkali remaining. Following another water rinse, the parts are ready for the corrosion resistant coating.

The coating solution is prepared by mixing 1 gal each of Iridite A and B solutions to each 10 gal of water. The pH is held below 3.5, or enough to color the castings adequately in 15 sec, and equal amounts of A and B solutions are added as needed to obtain the desired results in about this length of time. Temperature is kept at 85° to 90°F.

Treatment is followed with a cold dip rinse in running water and an air-agitated hot water rinse which must be kept below 160°F. Large castings are usually heated sufficiently by the hot water rinse to dry quickly, and small castings are dumped into a centrifugal dryer. Ample agitation of the work or of the solution is provided in all baths to insure proper contact of the solution with all surfaces, and a reasonable draining time between solutions is allowed.

One electric hoist serves the first four tanks and another is used for the three remaining tanks and centrifugal dryer. Both hoists are equipped with automatic timers. The first is set for the 35-sec dip in the cleaner, and the second is set for a 15-sec dip in the Iridite solution. A hinged arm at each tank is moved into position when the work basket is lowered, and automatically resets the timer when the basket is raised. This arrangement avoids leaving the load in the tanks longer than intended, and eliminates the need for the operator to watch a timing clock, thus promoting uniformity. Time in all except the sulfuric acid tank is not critical; castings should be removed from the latter at the first sign of gassing.

PREVENTING MINOR MILL DELAYS

STEEL mill delays are costly, particularly on continuous mills where any trouble between the heating furnace and the coilers or shears can shut down the whole mill. Delays can crop up for a variety of reasons, at any second, in the vastly complex machinery of a modern mill. Records of mill delays show that electrical troubles are numerous. Although many such delays are minor they can add up to considerable cost if they occur too often. A frequent minor delay found in some mills is the failure of limit switches.

In every phase of mill operation and machinery, there are countless limit switch controls so that good maintenance, foresight and constant care can help greatly in keeping a mill producing at top speed. This is of prime importance. It means dollars to the company, the workers and the stockholders.

There are many different types of limit switches. Those most common to steel men are the cam type, hatch type, and track type limit switch. There are others, too numerous to mention, but each of them has the same purpose, either to open or close the control circuit.

Makers of limit switches have done their best to build rugged switches which will operate under the worst possible conditions. However, even the best of equipment will eventually fail if not properly maintained.

A limit switch is just what its name implies. The motor must reach a certain speed, no faster or slower—the screw downs must move up or down \pm hundredths of an inch—no more, no less—the crane must travel just so far, no farther. Many operations are tied together electrically. Limit switches are a vital link in this complex circuit of modern mill machinery.

The main cause for limit switch failure is due to misalignment. This is usually caused by improper mounting of the switch, and tripping shoe, or the loosening of the mounting bolts. In either case, the arm of the limit switch is usually broken off, or bent. This prevents the arm from returning to its original position, the



Just say "Duloch wuz oiled."

circuit remains open and the control fails to perform its duty. The mill blows down, the foreman blows up and generally much commotion ensues. Therefore, proper mounting and alignment of limit switches and the tripping shoe cannot be stressed too highly, as a properly mounted limit switch will last indefinitely.

Another common cause for delay is water in the limit switch which can short out the wires to ground. Water is used in almost every operation in the rolling of steel. In a situation of this kind, waterproof connectors, gaskets and gasket seal should be used, and all wiring should be enclosed in conduit.

The cam type limit switch is geared directly to the armature of the motor through reduction gears. These switches are the most satisfactory type in general use. They give less trouble than most of the others, where they can be adapted to the purpose.

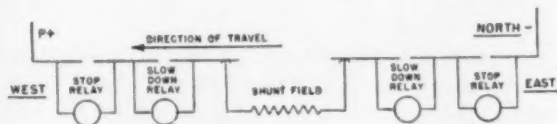


**Use of current relays instead of limit switches
can help eliminate electrical delays**



By **DAN J. KINZER**
Draper, Utah

Many of the difficulties with limit switches can be overcome by using current relays where the limit switch is of the track type. A transfer car is a good example of this. The limit switch can be eliminated by installing current relays on the rails which feed the shunt field of the motor. However, this application can only be employed where the motors are run through feed rails and collector shoes as shown below.



The above transfer car is traveling west. The current coils of the west slowdown relay short out as the car passes this point. This de-energizes the relay and opens the control cir-

cuit to drop out a step of acceleration. The car continues west until the collector shoes pass the break in the rail of the west stop relay. This further de-energizes the current coils, which opens the control circuit to the directionals. The eastern stop and slowdown relays are a repetition of this circuit. The variations of this circuit are broad, and its limitations bounded only by the ingenuity of the engineer.

Another cause of limit switch trouble is the laxness of some supervisors in properly instructing the employee in the operation of his equipment. Failure to notify an operator that a momentary overload of his machinery (due, of course, to several causes) will cut out the control circuit is a typical example. This can be corrected by centering the master switch.

Electrical magnetic brakes are another common source of delay, especially on overhead cranes. Poor brake shoe adjustment, improper alignment, worn brake lining, steel dust accumulating along with grease and oil, spell trouble to the maintenance man. Worn coil protective tubes in the plunger type magnetic brake is another cause of failure of electrical controls. The plunger wears through the brass tube, allowing residual magnetism to hold the plunger too long. The brake releases too slowly and gums up the operation.

Magnet cables are a headache to both production and maintenance men alike, especially on cranes removing scrap from the pits. Careful handling of the hook and magnet by the operator is essential. Making sure that the conveyor dumping scrap into the pits is not running while the magnet is in the pit, will do more than any other one thing to preclude cut magnet cables. In these cases screw type magnet cable connectors are a necessity, so removal of the magnet from the hook can be accomplished without delay.

It is common practice among some operators to have the magnetic brake disconnected on the trolley, the idea being to stop the swing of the hook. This is a dangerous practice and should be discontinued. If there were ever a loss of power while the trolley was traveling at full speed, there would be no way of stopping it, as most cranes are equipped with only magnetic brakes, and serious accidents could result. These magnetic brakes should never be disconnected but should be adjusted to the point where the swing of the boom is negligible.

All the types of delay mentioned can be kept at a minimum with proper maintenance. This includes supervision by competent electrical foremen, a periodic schedule of preventive maintenance, an adequate supply of spare parts, up-to-date wiring diagrams and blueprints, and an advanced training program.

Christmas Tree Dovetails

Crush Ground in Turbine Buckets



By **CHARLES L. SADON**
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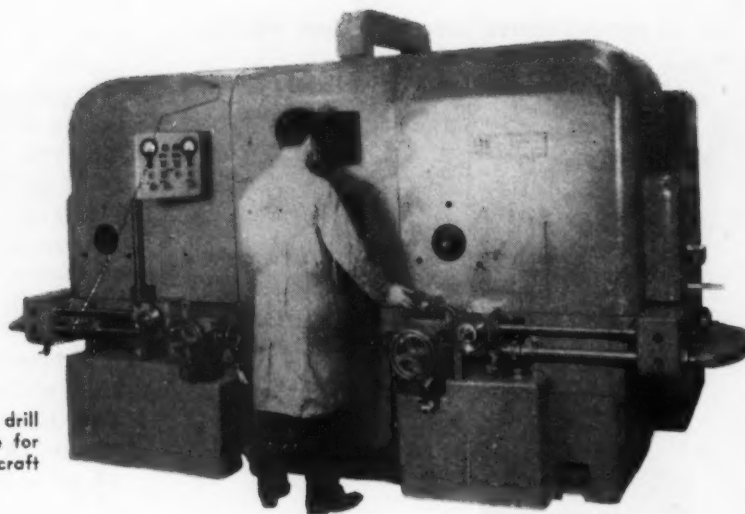


FIG. 1—Crush grinding threads of oil well drill bits lead to the development of this machine for grinding the Christmas tree dovetails in aircraft gas turbine buckets to ± 0.002 in tolerances.

Machining Christmas tree dovetails on aircraft gas turbine buckets is a tough job—the alloys are practically nonmachinable. But the work is being done by crush grinding with remarkable accuracy. Diamond dressed multi-ribbed wheels in a special machine hold tolerances of ± 0.0002 in.

OF all production problems encountered in the manufacture of the aircraft gas turbine, forming the Christmas tree dovetail on the bucket presents one of the most difficult. Materials used in making these buckets, whether cast Vitallium or forged S-816, are on the borderline of being unmachinable with present cutting tool materials including tungsten carbide, and

they also present serious problems in grinding.

As tough as the present day materials are, the trend is towards still tougher materials because continued improvement of aircraft gas turbines depends upon further developments of alloys that will withstand even higher temperatures, greater centrifugal forces, and more severe vibrational stresses than present alloys.

With the trend in the toughness of the bucket alloys so clearly charted, plans for developing production methods by milling and broaching were discarded at the Lynn, Mass., plant of General Electric Co., to concentrate on devising methods to grind present and future bucket materials. Not only was there a need to develop a method for grinding these alloys, but much had to be done to devise methods to grind the intricate Christmas tree shape of the bucket dovetail with greater accuracy.

Crush grinding was used with marked success in grinding the thousands of gas turbine buckets produced during the war. The method received such impetus from this wartime work that the technique was extended and developed by various grinding machine manufacturers until today hundreds of jobs are being done by this method.

Jones & Lamson Machine Co., Springfield, Vt., at the request of General Electric Co., developed the grinder shown in Fig. 1 for grinding the Christmas tree dovetails of the turbine buckets. This machine is a single-purpose unit designed around proved principles of the J&L thread grinder, but with the various machine elements arranged to give rigidity, repetition of accuracy, ease of operation, and safety to the operator.

The machine has two 20-in. wheel-diameter thread-grinder heads that oppose each other. Both heads are standard except that the right hand head is a mirror image of the standard left hand head, and a universal diamond dresser is

supplied for each head. Each head is powered with a 20 hp, variable speed, dc motor.

A motor rheostat, shown to the right of the operator in Fig. 1, is arranged with each wheel slide so as to maintain constant surface speed of each grinding wheel, regardless of the amount of wheel wear. Resinoid grinding wheels were chosen because of their ability to maintain wheel shape over many grinds, as in thread grinding; and driving power and wheel speeds up to 11,500 sfpm were provided.

A hydraulically operated vertical slide, shown in Fig. 2, carries the bucket, loaded in a shuttle, between the grinding wheels. The slide has pre-loaded ball bushings protected against grit and dirt by accordion-type boots. The speed of travel of the slide can be regulated from 0.5 to 8.5 fpm.

Push-Button Operation

The operation of the machine has been simplified to the push-button stage. The operator merely inserts the shuttle or fixture carrying the bucket to be ground into the locating nest. By releasing a foot-operated valve, the shuttle is hydraulically clamped. The operator then pushes the starter button, the door closes, the coolant valves open, the vertical slide reciprocates, the grinding wheels feed in a pre-determined amount for each stroke until the wheel slides come to their positive stop, the vertical slide stops at its lower position, the coolant is shut off, and the door opens. If required, and controls are set for it, the grinding cycle stops before the last cut, both wheels are diamond-dressed, the position of wheel slides are adjusted for the amount dressed off the wheels, and the grinding cycle is completed as described.

Safety and cleanliness were obtained by completely hooding the machine. The oil vapor and mist problem has been eliminated by the use of an electronic oil mist collector. The clean lines and smart appearance of the machines demon-

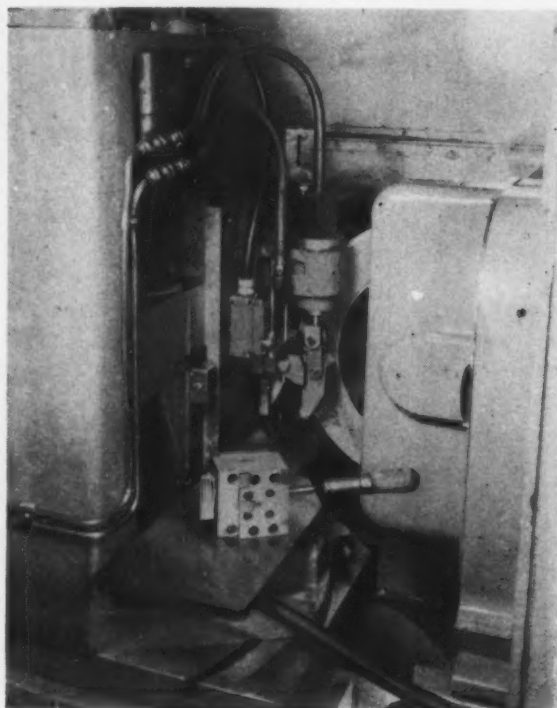


FIG. 2—This vertical cylinder arrangement holds the fixtures containing the buckets during grinding. By placing the shuttle fixture in the machine locating nest and tripping a foot valve, the arrangement moves the work into grinding position and clamps it.

FIG. 3 — The diamond dressing cam has the shape of the dovetail and controls the travel of the diamond dressing tool. This cam arrangement is one of the most important features of the machine.



Crush Grinding

Crush grinding, or grinding with a wheel formed to the desired shape by a formed crushing roll, was used extensively in England prior to the war, but laid fairly dormant at GE's Lynn, Mass., machine shop as late as 1942. Because the method seemed to have merit in forming turbine bucket dovetails and because the necessary machines were available in the shop to start development work, General Electric started investigations as to its feasibility.

E. V. Flanders, chief engineer of the thread grinder dept., Jones & Lamson Machine Co., Springfield, Vt., at the 1947 Spring meeting of the American Society of Tool Engineers, read a paper entitled: "Crush and Diamond Dressing as Applied to Thread Grinding." The paper included a description of a highly successful Jones & Lamson machine for crush grinding threads on oil well drill bits, using diamond dressed, multi-ribbed wheels.

Meetings between General Electric and Jones & Lamson engineers resulted in the development of the machine for grinding Christmas tree dovetails in turbine buckets.

Christmas Tree Dovetails

Continued

strates that hooding was the result of careful planning, making the machine worthy of the award presented by the General Electric Safety Dept., as "*The safest machine in the division.*"

The pressure faces of the Christmas tree dovetail of the aircraft gas turbine bucket are designed to withstand the centrifugal pull of the bucket, which is approximately 12,000 lb when the turbine is in operation. With such a load, designing engineers would prefer to specify zero tolerances on the spacing of the dovetail faces so that the load would be equally distributed on each hook or serration. Since zero tolerances would reduce production to zero, a bogey of ± 0.002 in. tolerance was set for the total variation of the pressure face pattern for both male and female dovetails.

With the Jones & Lamson grinder, the basis of obtaining this accuracy lies in the diamond dressing cams. The cam shown in Fig. 3 has the shape of the dovetail, with the height of the cam

lobes to the height of the dovetail serrations in 1:1 ratio, and the pitch of the lobes to the pitch of the serrations in 2.5:1 ratio. With such favorable ratios, the generation of accurate pitch spacing is simplified, and, since the grinding wheels can be dressed before the final cut is taken, excellent accuracy of product results.

Wheel trueing diamonds are set in the holder shown in Fig. 4. This holder is located in the wheel dressing device by a keyway and secured by a cap screw. When replacing the diamond, it is accurately positioned and aligned with the key on the holder with the aid of an optical com-

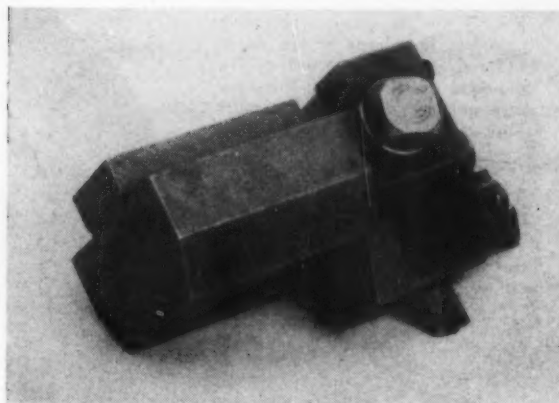


FIG. 4—The dressing diamond is set in this holder and held by screws. Its height can be adjusted by screws.



FIG. 5—After any adjustment affecting the dovetail shape of the bucket, such as replacing the diamond, a steel coupon is ground and checked by an optical comparator.

parator. The holder is located in the keyway of the comparator fixture and the diamond adjusted so that its 50 diameter shadow image coincides with the layout on the comparator screen. The fixture on the comparator has been correctly aligned with the screen by the use of a master diamond.

After replacing the diamond in the grinder or after any adjustment that might affect the dovetail shape on the buckets, a machine steel dovetail-formed coupon is ground. This eliminates spoilage of an expensive forging. The final alignment error of one wheel shape with the other is determined by comparing a 20 diameter shadow image of the machine steel coupon form with an accurate layout on the comparator screen, as shown in Fig. 5. To make corrective adjust-



FIG. 7 — In this grinding shuttle-type fixture, the bucket is located at two extreme cross-sections by guillotine jaws and a stop to position lengthwise the inside of the bucket gas chamber.

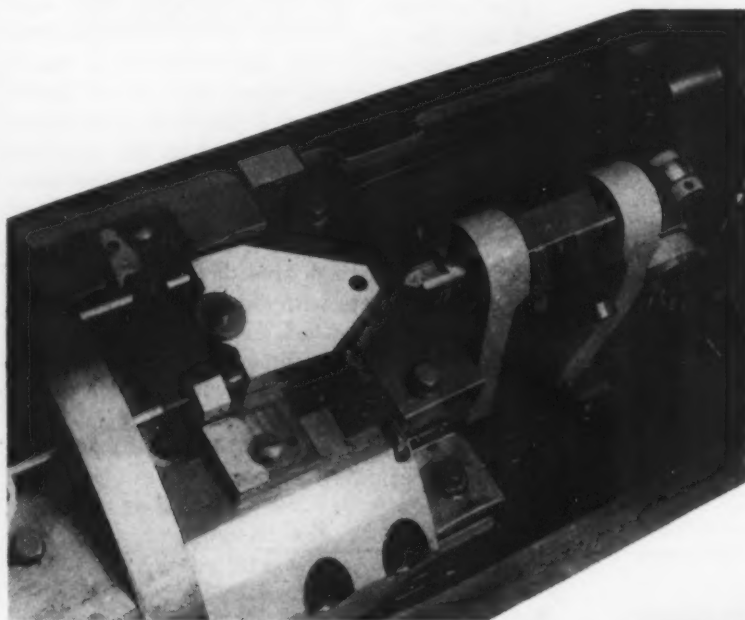


FIG. 6—The wheel trueing cam is adjustable. It is held friction tight by screws and keyways align it. By a screw adjustment, movement of the cam is transmitted to a 0.0001 in. reading indicator. A spring eliminates backlash.

ments, the wheel trueing cam on the right hand head of the grinder is adjustable, as shown in Fig. 6.

Buckets are ground from rough forgings, which, because of their shape and forging die misalignment, usually require removal of more than 0.100 in. of stock on a side.

Buckets are held in block or shuttle fixtures, shown in Fig. 7 and also on the machine table in Fig. 2. They are located in the shuttle at two extreme cross-sections by guillotine jaws. The stop button positions lengthwise the inside of the bucket gas chamber. The shuttle was designed to reduce to a minimum the manual labor required to load it by eliminating the usual screw tightening of the bucket in the block. Each grinder is equipped with three blocks. While one is in the grinding machine, the second is draining of excessive oil, and the third is being loaded.

Fig. 8 shows the work loading station of the grinder. By energizing the air cylinder, the spring pressure on the block is released, the

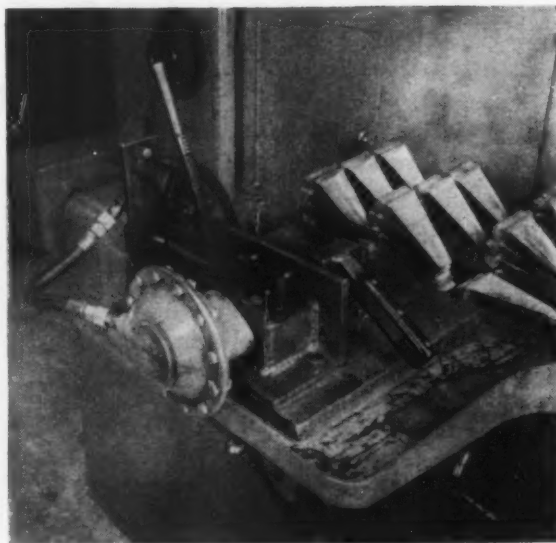


FIG. 8—The work loading station of the grinder. This air cylinder arrangement opens shuttles for unloading and reloading. Three shuttles per machine are used.

ground bucket is easily removed, and a new bucket is loaded. The release of the air pressure allows the spring cover to secure the bucket sufficiently to transfer it into the machine where it is rigidly held during grinding by the hydraulically operated toggle clamp and plunger arrangement shown in Fig. 2.

With the block secured in grinding position, the starting button is pushed and the whole grinding cycle takes place. This grinding cycle may include the automatic dressing of the wheels and adjustment for wheel diameter reduction.

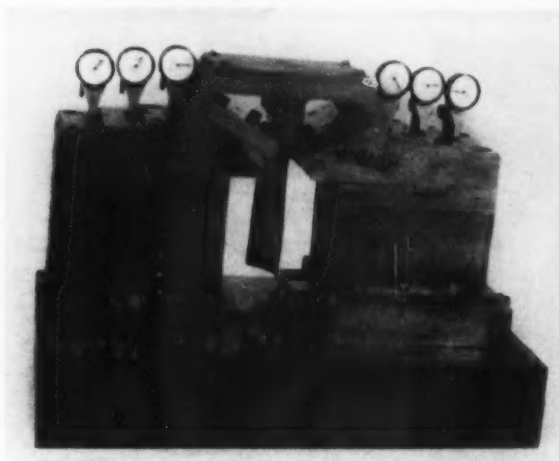


FIG. 9—Serrations and faces of the dovetail are checked in this gage.

The grinding cycle is 1 min, of which 15 sec are used for wheel dressing.

As previously emphasized, the most important part of the dovetail is the accurate spacing of the pressure faces. It was not only a problem to obtain this accurate spacing, but the work was difficult to inspect. The inability of measuring to tenths of thousandths with optical comparators is well known, especially when the part so measured has considerable thickness.

With "necessity the mother of invention," the checking gage shown in Fig. 9 was built. This gage has accurately spaced pressure faces, Carboloy faced, that line up with the hooks or serrations of the bucket dovetail. When the equally accurate master dovetail is inserted into the gage, all pressure faces make contact and have zero space between them.

The indicators, through fulcrums, make contact with the pressure faces of the master dovetail and are set to zero, designating zero space. When a bucket dovetail whose pitch is not identical to that of the master is inserted in the gage, it will most likely make contact on one pressure face on each side. The indicators for these faces will read zero, but others will read the amount of space or error in the pitch.

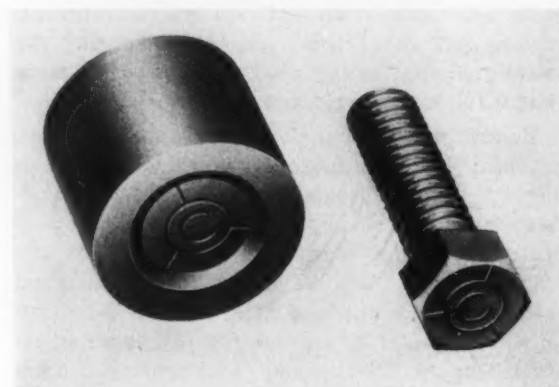
Grinding Christmas tree dovetails in aircraft gas turbine buckets with diamond-dressed wheels is now a proven method. Further developments lie chiefly in the development of better grinding wheels that are free and cool cutting and that retain their form over longer periods of time, and in the development of coolants as worthy partners to improved grinding wheels.

Bolt Heading and Marking Hammers

COMBINATION bolt heading and marking hammers of solid carbide for automatic bolt heading machines make possible the elimination of separate marking operations frequently performed in the manufacture of bolts, nuts, rivets and similar products. Simultaneously with the heading operation, bolts, screws, and rivets can be marked to indicate size or analysis of metal or both during the heading operation. Clean markings over long runs are assured because of the extreme hardness and wear resistance of tungsten carbide.

The hammers, made by Carboloy Co., Inc., Detroit, are available with either male or female markings and in a complete range of sizes. Any pattern, numerals, combination of lines or other markings can be furnished.

In one instance, as many as 900,000 cap screws in production runs have been marked without



any signs of wear on the markings. When the markings eventually do become worn, the carbide hammers can be reground for use in plain heading operations.

Fixture



By **ROBERT MAWSON**
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Speeds

Critical Grinding

Octagonal shaped cams with critical surfaces are ground in a novel fixture. The fixture locates positively each face to be ground in relation to the grinding wheel, and permits rapid indexing of the work so that all eight sides can be ground in one fixture setting.

IN a free-wheeling clutch incorporated in most of the Hy-Draulic machine tools built by the Rockford Machine Tool Co., Rockford, Ill., is an octagonal cam on which a series of machining operations and an extremely critical grinding operation are performed. To function properly, the 1.983 in. octagonal cam must be true and concentric. The part is shown in fig. 1. The sequence of operations to machine this cam are as follows: Face, drill, bore and rough turn; rough broach; finish turn on a splined arbor; hob flats; drill and ream; carburize; finish broach; harden; grind flats; and inspect.

The grinding operations on the eight faces of the octagonal shaped cam are performed in a fixture devised especially for this job. The required accuracies are such they are most easily achieved through a positive locating fixture, such as that shown in fig. 2.

The fixture has a cast iron body finished on critical surfaces. In accurately machined holes in the body are placed two sets of Norm-Hoffmann ball bearings. The spindle is made of carburized, hardened and ground cold rolled steel, machined to a good fit for the bearings. In this spindle is machined a No. 4 Morse tapered hole, and on the spindle is mounted an index ring (1), made of hardened and ground tool steel.

In this index ring are accurately cut eight notches at 45° increments. The ring is held in

contact with the spindle by means of a set screw (2) machined with a 90° cone point and threaded into the ring to fit into a milled slot in the spindle. Between the rear bearing and the index ring is a cold rolled steel spacer (3). The index ring is held in position with the body by means of a steel lock nut and washer (4). On the rear end of the spindle, fastened with a set screw, is a hand wheel (5) with a knurled surface.

The tapered hole in the spindle is fitted with a stub arbor made of carburized, hardened and ground cold rolled steel. The front or projecting end of the arbor has machined and ground splines that provide a good sliding fit in the broached hole in the workpiece. The arbor is held in the spindle with a steel draw bolt (6), which is threaded and screwed into the tapped hole in the arbor. The workpiece is held on the arbor with a steel C-washer, a standard washer and a hexagon nut.

The front bearing is held in place by a steel retaining plate attached to the body of the fixture with six flat head screws. Into a 1-in. reamed hole in the body of the fixture is driven a steel bushing (7), and on a machined upper surface of the body is fastened with four socket head screws a cold rolled steel plunger housing (8).

The index plunger (9) is made of cold rolled steel, case hardened with the contact surface machined to have a good sliding fit in the

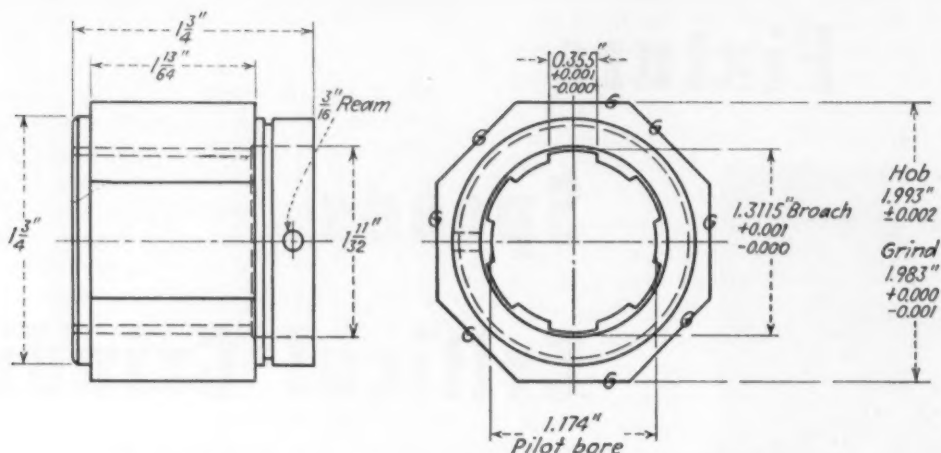


FIG. 1—This cam must be ground with extreme accuracy on all eight sides. To do this grinding, a fixture was developed that positioned the cam under the grinding wheel quickly and accurately.

notches of the index ring. In a counterbored opening in the plunger housing is placed a steel tension spring (10). The index plunger is prevented from rotating by a dog point set screw (11) threaded into the plunger housing and entering a machined slot in the index plunger. On the upper end of the plunger is fastened, with a steel pin, a cold rolled steel knob. In a machined counterbore at the upper end of the plunger housing is mounted a Victor seal.

In using this fixture for grinding, the fixture is located with its machined V on the way of the grinder table, the two machined keys in the base of the fixture fitting the table slot.

The cam to be ground is placed on the arbor, fitting the broached notches. The C-washer is replaced and the nut tightened to securely locate the part. The workpiece slides over the washer and the nut, the C-washer holding it in place.

The index plunger (9) is raised and the arbor rotated with the hand wheel (5) until the

plunger contacts one of the notches in the index ring (1). The grinder is then started in operation and as the fixture feeds under the revolving wheel, one of the octagonal surfaces on the piece is ground. The table, carrying the fixture, is then moved back. The next position is determined by pulling back the index plunger and rotating the arbor until the plunger enters the next slot in the index ring.

By turning the arbor, locking it with the index plunger, and grinding the faces in succession, all eight surfaces on the workpiece are finished. By backing off the locking nut and slipping off the C-washer, the cam is removed from the fixture.

This fixture performs the accurate grinding required on the workpiece with a minimum of non-machining or unproductive time. It is positive for locating and holding the workpiece, and has the further advantages in that the work of grinding is in the open and in sight of the operator.

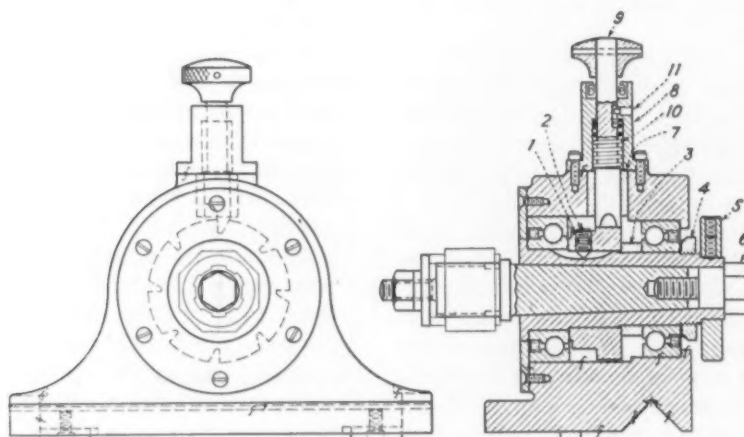
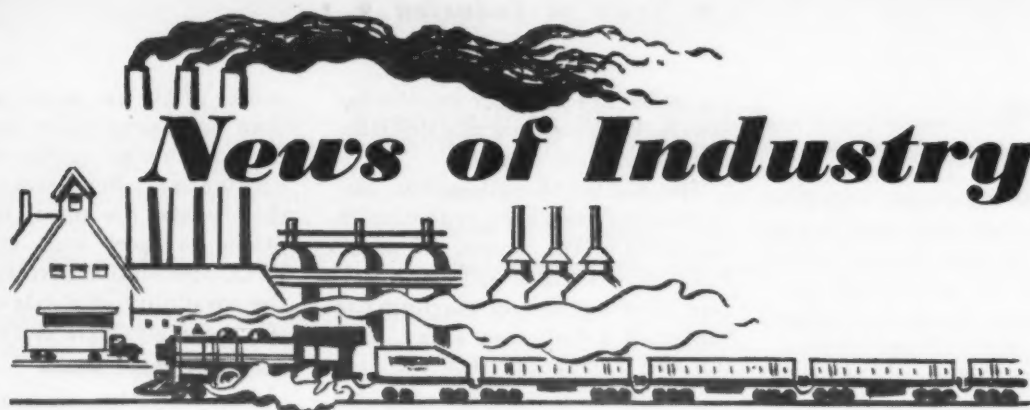


FIG. 2—Details of the fixture for grinding the cam shown in fig. 1. The fixture fits over the V ways of the grinding machine and is locked in position by the two machine keys in the base fitting the table slot and held by nuts on two T-head bolts fitting the slots.



Tin Price Drop Threatens U. S. Smelter

Lack of agreement with Bolivia perils raw material for Texas smelter . . . Rise in Far East output, U. S. trend to electrolytic tinplate hurt price.—By JOHN ANTHONY

New York—With the tin price spiral spinning madly, the Reconstruction Finance Corp. has been sinking deeper and deeper into a tin price rut. It must stop soon or the strategic Texas smelter may close. The rut is not all of RFC's making: Far Eastern tin production is back up to prewar levels and the United States, world's No. 1 consumer, has not stepped up its demand. Therefore, world tin prices are falling.

Decline Has Hurt Bolivia

As they fall, RFC drops its New York selling price to meet competition and hence the price it pays for the Bolivian concentrates that feed the Texas smelter. Importers and brokers then drop their price for prompt delivery below the RFC price. A few days later RFC again lowers the price. Result: A downward tin price spiral with no bottom in sight.

Bolivia has been the principal sufferer from the sharp drop in world tin prices during the past 4 months—a matter of 28½¢ per lb in the New York market. RFC has been buying Bolivian low grade concentrates as the principal feed for the government smelter at Texas City, Tex., at a price tied to the New York tin market. Bolivia

buys in the dollar area; its economy is almost wholly dependent on exports of tin concentrates.

Every drop in tin is a shock to the Bolivian economy. The impasse with Bolivian miners threatens operation of the Texas smelter, built to provide a Western Hemisphere tin supply in case of war. RFC buys the lower grade Bolivian ores, the higher grade Patino ores going to the United Kingdom under long standing contracts. Continued reduction in the price of tin could shut off these low grade concentrates.

The United States demand for tin has not gone up as some expected, mainly because of the in-

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Harnischfeger Gets Patent

New York—Harnischfeger Corp., developer of the Magnetorque control or the eddy current preloaded controllable speed motor, has been granted patent number 2493607 by the U. S. Patent Office. Applications have been made for foreign patents.

In 1949 the company reports the trend was to ac controlled overhead cranes. In the swing away from dc crane controls, the ac con-

trols captured approximately 60 pct of 1949 output.

More than 300 P&H Magnetorque control installations have been made on overhead cranes. Because of the accurate requirements of fine speed controls, the new method of ac controls makes possible installations of ac equipment where previously only dc controls could be used.

Nail Machine Business Sold to Ohio Electric Mfg. Co.

Cleveland — Black Industries, Inc., Cleveland, one of the nation's largest manufacturers of nail making machines, has been purchased by the Ohio Electric Mfg. Co.

Ohio Electric is taking over all present business of Black Industries and will continue to deliver spare parts to former customers.

Chester Bland, president of Ohio Electric Mfg. Co., said the purchase is one more phase of the company's program of market expansion and product diversification. Ohio Electric also makes electric lifting magnets, heavy duty hoists and fractional horsepower motors.

Electroplaters Plan Meeting

New York—The Annual Educational Meeting of the N. Y. Branch of American Electroplaters' Society will be held at the Hotel New Yorker on Saturday, Feb. 25, 1950, at 2:00 p. m. It will be followed by a banquet at 7:00 p. m.

Tin Price Drop

Continued from Page 99

creased use of electrolytic tinplate as against hot-dipped. The same amount of tin now covers more plate than it did before the war. And war-borne tin-free bearing compositions and collapsible tubes, having proved themselves, are still in use.

But the tin price spiral has been slowing down. "Backwardation," the price spread between prompt tin and 3-month future delivery, has been narrowed appreciably since the free market in tin opened in mid-November. In the beginning the backwardation was about 7¢ per lb. Now it is quoted at only 3/8¢. This cuts down the margin available to traders.

Meanwhile RFC has been selling very little tin. But brokers are also selling very little at this time as buyers are afraid to come into the market beyond their minimum requirements. Buyers who had been taking tin in carload lots are now buying in 5-ton lots.

Singapore Market Is Stable

On the other hand, the Singapore tin market on which Straits tin is traded has remained remarkably stable during the past several months, indicating that heavy buying is going on. The trade here is in a quandary as to who could be buying so heavily on that market.

The price of tin is being supported on the London Metal Exchange by the British Ministry of Supply. The Ministry is buying spot tin at £600 per long ton, the equivalent of 75¢ per lb at the official exchange rate. But the backwardation there is much greater than in New York. Futures can be bought on the London market more in line with the New York market.

British Have Not Lost

RFC has been unable so far to agree with Bolivia for 1950 deliveries. An agreement has been reached with delegates of the Netherlands, subject to approval by that government. Dutch con-

centrates are used for sweetening the Bolivian concentrate feed for the government smelter.

The United Kingdom has lost nothing by the sharp reduction in the price of tin, except the possibility of making a killing in dollars. Devaluation of sterling has protected it from loss so far. During the war the British Ministry of Supply took over the total output of tin from British Empire producing areas. This arrangement was continued until on Nov. 15 when the London Metal Exchange was reopened for trading in tin.

In terms of sterling, the British

stocks of tin are worth more now than their acquisition costs. British government stocks of tin are substantial. Representatives of the Ministry are now in the United States to meet with officials of RFC. Speculation revolves around the possibility of a sale of British tin to the strategic stockpile.

Belgians Hurt Some

The Belgians have also been suffering to some extent from the lower tin price. The Belgian franc had been fairly firm and was devalued by only 13 pct, compared with a tin price cut of 27.6 pct from the \$1.03 peak.

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Better, Steadier Pig Iron Market Seen

Steadier market believed in prospect . . . Active first half predicted but jobbing foundry business is dull and iron demand does not match steel.—By BILL LLOYD

Cleveland—Increased shipments over 1949 and a steadier market appeared to be in prospect for the Midwest's merchant iron industry this week.

An active if not strident demand from the automotive, farm implement, sanitary ware, machine tool, oil and gas equipment and

rail equipment producers has prompted a substantial change in the merchant iron outlook during the past 30 days, despite a relatively low level of operations in the general jobbing foundries.

Inventories Are a Key

Inventories are another factor. Stocks of iron and finished castings are moderate—larger than they were during the first quarter of 1949 but smaller than they were when the iron and steel business went into a tailspin in early April. Liquidation of these inventories and fluctuations in demand kept the merchant iron business in a subnormal condition for most of 1949.

Producers' inventories are generally higher than they were a year ago, but the tendency has been to curtail operations rather than build up abnormal inventories at present costs.

At present, at least one major producer is allocating tonnage. This, however, is a temporary expedient induced in part by the shortage of coal and coke. Also, the non-integrated steel companies are buying.

Most observers foresee a very



"I never mix business and pleasure but I'll make this one exception."

active first half, with shipments declining somewhat during the summer months as a result of plant vacation periods and other seasonal factors, and picking up again in late August or September.

Shipments of all grades of iron in 1949 totaled about 3,350,000 net tons. If merchant iron producers are, as many predict, to top this tonnage this year, the answer will probably lie in the tonnage consumed by the general jobbing foundries, where there is the greatest room for improvement.

Pricewise, the merchant iron market is firm. Some producers find the price differentials of imported iron disturbing, particularly in the Eastern markets, but it is expected to have little if any important effect on the general market. As evidence of this, some furnaces in the East are building inventory.

Some Absorb Freight

On the other hand, certain non-integrated producers are absorbing some freight. In areas where production exceeds consumption by a wide margin, and isolation is the price of refusal, more of this by small producers can be expected.

Biggest variable in the merchant iron market at the moment is coal. If continuity of supply can be assured, switching of sources and wildcat prices will be out, for there is definite evidence that consumers are again valuing steady sources of supply.

Some observers see the merchant iron industry at the crossroads. They argue that merchant iron is not matching the pace of finished steel and that there is either going to be a sudden improvement in merchant iron demand in all sectors or steel demand is going to tumble.

Blaw-Knox Pays Dividend

Pittsburgh—The Board of Directors of the Blaw-Knox Co. declared a dividend of 25 cents a share on common stock, payable March 14, 1950.

Leasing Plan May Help Car Builders

Idea involves private or insurance company financing with small cash outlay required by railroads for freight cars.

Fact is more cars are needed.—By GEORGE ELWERS.

Chicago—Railroad car building may get a lift out of the doldrums from a proposed method of equipment financing which would make new cars available without any capital outlay by the railroads. At least three major car builders have been discussing the idea with railroads for several months. However, many legal and financial "bugs" are yet to be worked out, and negotiations are not yet near the contract stage.

Plan Is Attractive

Details of the proposals being made to railroads are top secret. The important fact is that they are known to provide for financing and ownership of new cars by interests independent of the railroads, with cars leased to railroads on a per diem basis. The money is believed to be coming largely from insurance companies.

A car lease plan has many attractions to railroads and to car builders. Railroads are notoriously boom-and-bust buyers. When times

are good they flood the market with orders and bid up prices to get cars. When carloading and income drop, they make old cars last longer and leave the builders sitting with no business.

A leasing plan would provide for orderly retirement of old cars as they reach the age where maintenance costs begin to rise sharply and smooth out the flow of orders to builders. Further, a railroad's ability to buy new cars under equipment trust agreements depends on its having cash to put up 20 pct of the purchase price, and a good enough credit rating to get a favorable interest rate. A leasing plan would require no large cash outlay to initiate building, and the interest rate would depend on the lessor's, not the lessee's credit. So new cars could be built regularly according to the railroad's actual need, not their financial position.

Some Roads Not Interested

However, railroads which are in comparatively good financial shape aren't too enthusiastic about car leasing. Two major roads told THE IRON AGE that they have studied and rejected leasing plans. In the first place, most roads that are in a position to build their own cars prefer to do so. They say they can build them cheaper than the independent builders.

Historically, independents built 80 pct of railroad cars, but their share has dropped to an average 60

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Salaried Employees Get Pension

Pittsburgh—Improved insurance and pension plans for salaried employees, effective Jan. 18, have been placed in effect by the United Engineering and Foundry Co.

Benefits are the same as those offered to hourly-paid employees.



"They've come to see about a billion dollar loan so they can develop their island trade."

INDUSTRIAL SHORTS

BUDD BUILDING—An option on a 140-acre tract at Gary has been taken by BUDD MFG. CO. for the erection of an automobile body plant. Plans call for a manufacturing building with 250,000 sq ft of floor space. The new plant is expected to serve principally Studebaker Corp. at South Bend and Nash Motors at Kenosha, Wis.

NEW OWNERS—The O.K. Tool Co., Shelton, Conn., has been purchased by WILLIAMS & HUSSEY MACHINE CO., Wilton, N. H. Offices and manufacturing at Shelton moved to Wilton. The tool company will retain its identity and operate as a division of Williams & Hussey.

HEADS GROUP—E. C. Hughes, vice-president of Bay State Abrasive Products Co., Westboro, Mass., has been elected president of the GRINDING WHEEL INSTITUTE at their annual meeting held recently.

NEW AFFILIATE — A new Round Associate Chain Co. known as the ROUND CHAIN & MFG. CO., has been formed in Chicago. The new concern will be directly affiliated with the five other Round Chain plants. John F. Ansink will be general manager.

ACQUIRES DRYERS — The Drying Machinery Div. of Hersey Mfg. Co., Boston, has been purchased by STANDARD STEEL CORP., Los Angeles, fabricators of heavy steel plate and manufacturers of drying and dehydration equipment.

FOREIGN AGENT — The Wales-Strippit Corp., North Tonawanda, N. Y., has appointed the E. W. BLISS CO., New York, as exclusive foreign agents for the Wales Sheet Metal Fabricator. Bliss company, having fifteen foreign sales offices, will introduce the fabricator to the European trade at the International Fair at Milano, Italy, Apr. 12 to 29.

IN BUSINESS — M. Satin, formerly purchasing agent for Penn Galvanizing Co., Philadelphia, has announced the formation of a company engaged in selling steel and steel products, the M. O. SATIN CO. at Broad & Chestnut Sts. in Philadelphia.

HARD-N-DEEP—The development of a low-cost, quick acting steel hardening compound, Hard-N-Deep, has been announced by the MIRACALLOY CORP., New York. It is a powdered chromium-carbon material and contains an exclusive Catalyst XL-7.

GROWING—As part of an expansion program to increase the company's line of metal finishing chemicals, ALLIED RESEARCH PRODUCTS, INC., Baltimore, has purchased the R. A. Hoffman Chemical Co., Cleveland. Hoffman Chemical will remain in Cleveland until it can be transferred to Baltimore where new laboratories are being completed at the Allied Research plant.

BETTER SERVICE — A new diesel locomotive parts storeroom has been opened by the BALDWIN LOCOMOTIVE WORKS, Philadelphia, at Houston. William A. McKnight, district manager, is in charge of the new storeroom.

EXPANDS MARKET — The nail making machine business of Black Industries, Inc., Cleveland, has been purchased by the OHIO ELECTRIC MFG. CO., Cleveland. Ohio Electric also makes electric lifting magnets, heavy-duty electric hoists and fractional horsepower motors.

A-C DEALER—Allis-Chalmers, Milwaukee, has named the DRILL MASTER SUPPLY CO., Evansville, Ind., a dealer for their motors, controls, centrifugal pumps, transformers and circuit breakers in portions of Indiana and Kentucky.

Freight Car Leasing Plan

Continued from Page 101

pct, and one western road is now taking care of 50 pct of its own building program.

Leasing of cars as against outright purchase is not attractive to a road with enough cash and a good enough credit rating to buy. They point out that at the end of one current 10-year lease plan, the road will have paid per diem enough to pay the car's cost plus interest charges plus profit, but though the car still has value, they won't own it.

The need for new cars wasn't as great as the Government contended last year, but it has turned out to be a great deal more than the railroads then expected.

New Orders Are Off

New car orders have been cut substantially more than carloadings have dropped since the war, despite the fact that in wartime car space is more efficiently used than in peacetime shipping. Last year new car orders reached a low touched only in two other years since 1900.

Building programs have fallen behind overage retirements. A recent upturn in car orders from some roads indicates that replacement programs are being revised upward by railroads which can afford to do so. For those that cannot afford to buy all the cars they would like to have, a successful car leasing plan at the right per diem fee may provide them with the means to boost the business of car builders and their suppliers.

Resume Your Reading on Page 101

Lackawanna RR Orders New Cars

New York—The Lackawanna Railroad has ordered 300 covered hopper cars from the American Car and Foundry Company. These 70-ton capacity cars will be used for bulk shipments, such as cement, which must be kept absolutely dry. The cars, identical to 100 made for the Lackawanna RR last October, will be built in ACF's Berwick, Pa., plant.

Index Shows Upswing In Automobile Production Rate

Detroit—The rising tempo in automobile production is reflected in the latest industrial employment index compiled by the Industrial Department of the Detroit Board of Commerce.

According to John R. Stewart, statistician, the January 15 index was 149.2 compared with 141.3 two weeks earlier. The index for January 15, 1949, is 159.0.

Large Orders Received By Baldwin Locomotive Works

Pittsburgh—Orders totalling approximately \$2.25 million have been placed with Baldwin Locomotive Works by the Missouri Pacific Railroad Co. and Westinghouse Electric International Co. since Jan. 1. Eleven 100-hp diesel-electric switching locomotives are being made for the Missouri Pacific and four 33,500-hp hydraulic turbines for Westinghouse International.

Other orders since the first of the year include one 750-hp diesel-electric switching locomotive for the Warner Co. and another for American Cyanamid, three 1000-hp switching locomotives for the Seaboard Air Line Railroad Co. and two steam locomotives of the 2-6-6-2 type for the E de F Teresa Christina, Brazil.

Army Hands Out Contracts

Washington—Army procurement contracts have been awarded to the following firms: Murphy Diesel Co., Milwaukee, \$176,319.55, spare parts; Henry's Truck Parts & Sales, Los Angeles, \$106,661.78, truck spare parts; and Butler Mfg. Co., Kansas City, \$103,681.10, 4000-gal gasoline semitrailers.

File Damages for Donora Tragedy

Pittsburgh—Damage suits against the American Steel & Wire Co., as the result of the fatal smog at Donora, Pa., in October, 1948, total \$1,668,350 with the fil-

ing of ten additional actions in Federal District Court here. The company operates a zinc works at Donora.

Steel Jobbing Co. Organized

Youngstown—Hoffman Steel Products Co., jobber and distributor of steel products, including sheets, strip plate and structurals, has been organized by Harry B. Hoffman, who recently resigned as vice-president, director and manager of the warehouse division of Wilkoff Co. here.

Vanadium-Alloys Dividend

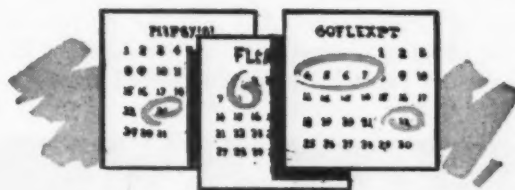
Pittsburgh—The board of directors of Vanadium-Alloys Steel Co., Latrobe, Pa., has declared a dividend of 75 cents per share payable March 2, 1950, to stockholders of record Feb. 14.

Marshall Plan Funds Purchase New Equipment for French Plant

Washington—Slightly more than \$1 million of Marshall Plan funds has been authorized for the installation of modern equipment, including spindles, at the Lille plant of the Le Blan Co. The company, manufacturer of automobile tire cord, expects the new equipment to increase tire cord production by 1200 metric tons.

Dip in 1949 Coal Production

Washington—An estimated 478 million tons of coal were mined by American industry during 1949 according to preliminary figures released by the Bureau of Mines. This amount closely approximates 1939 total coal production and falls below 1948's total of 657 million tons by 27 pct.



Dates to Remember

• HELP THE HEART FUND •

- Feb. 12-16 American Institute of Mining & Metallurgical Engineers, annual meeting, New York.
- Feb. 15-16 American Hot Dip Galvanizers Assn., annual meeting, Cincinnati.
- Feb. 27- American Society for Testing Materials, spring meeting, Pittsburgh.
- Mar. 3
- Mar. 14-16 Society of Automotive Engineers, passenger car, body and production meeting, Detroit.
- Mar. 16-17 Pressed Metal Institute, technical symposium, Cleveland.
- Mar. 20-25 Concrete Reinforcing Steel Institute, annual meeting, Houston.
- Mar. 21-22 Steel Founders' Society of America, annual meeting, Chicago.
- Apr. 3-4 Assn. of Iron & Steel Engineers, spring conference, Birmingham.
- Apr. 4-7 National Assn. of Corrosion Engineers, annual conference, St. Louis.
- Apr. 4-8 Chicago Technical Societies Council, national production exposition, Chicago.
- Apr. 5-7 American Institute of Electrical Engineers, conference on electric welding, Detroit.
- Apr. 5-7 Midwest Power Conference, Chicago.
- Apr. 10-12 American Institute of Mining & Metallurgical Engineers, annual openhearth, blast furnace, coke oven and raw materials conference, Cincinnati.
- Apr. 10-14 American Society of Tool Engineers, industrial cost-cutting exposition, Philadelphia.
- Apr. 11-12 American Zinc Institute, annual meeting, St. Louis.
- Apr. 12-14 American Society of Mechanical Engineers, spring meeting, Washington.
- Apr. 12-14 National Petroleum Assn., semiannual meeting, Cleveland.
- Apr. 24 Packaging Machinery Manufacturers Institute, semiannual meeting, Chicago.
- Apr. 25-26 Metal Powder Assn., annual metal powder show, Detroit.
- Apr. 27-28 American Steel Warehouse Assn., annual meeting, Houston.

Billet Shear Simplifies Slug Preparation

Bethlehem, Pa.—A 700-ton billet shear—with a specially designed retracting gage to simplify its operation—has been built by the Bethlehem, Pa., plant of Bethlehem Steel Co. for a major automobile manufacturer.

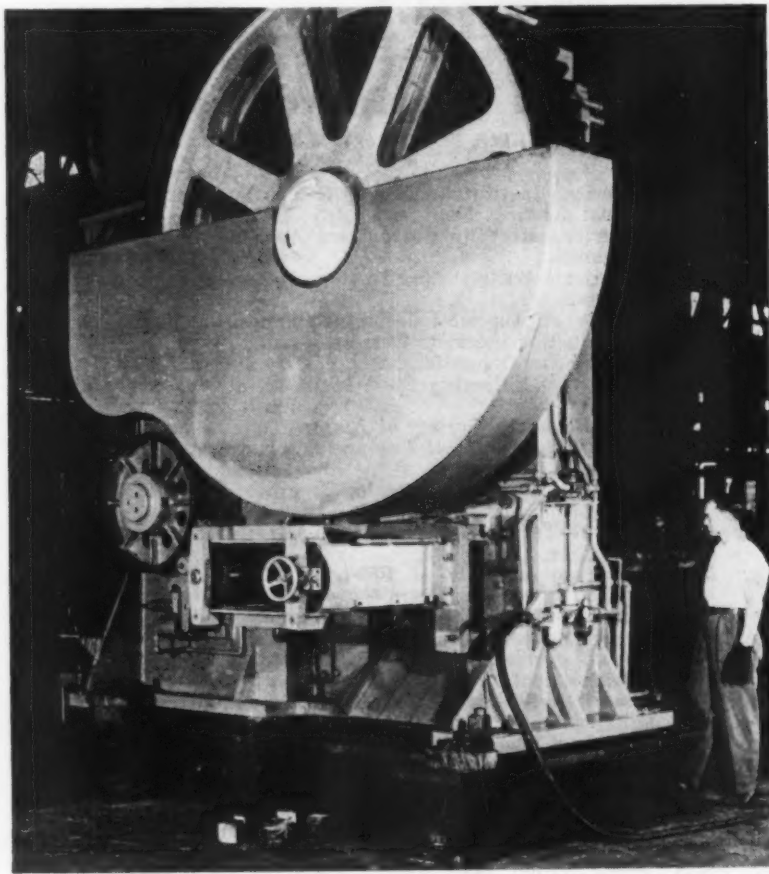
On one side of the machine, billets are fed in continuously by an automatic conveyer. They emerge as slugs on the other side, tumbling down a chute. The slugs are shown on the floor in the accompanying photograph.

The shear cuts mild steel billets up to 6 in. sq and 105,000 psi tensile steel billets up to 4 in. Two 3-in. high tensile steel billets can be cut at once.

The hinged gage, in the lower center of the picture, swings out of the way so that workmen can easily get at the shear blade. Through synchronization, the gage also retracts before the blade cuts, letting the slug drop freely.

The accuracy in cutting is achieved by an air-cushioned gage which cushions the stopping of the moving billet and spots it in the correct position.

The billet is advanced at the rate of about 140 fpm by a power feed table. At this high speed the billet would inflict a severe impact on the gage, but as the gage is air-cushioned, the effect of the impact is virtually nullified and the correct positioning of the billet is assured by the recoil action against the positive stop. The gag roller rests in spring-cushioned brass bearings.



Remedy Suggested to Aid Small Business Capital Problem

Washington—Government guarantee of commercial loans for small business is being discussed in the Senate as a remedy for the problem of obtaining long-term capital.

A bill sponsored by Senator Lucas, D., Ill., provides that the Reconstruction Finance Corp. be authorized to guarantee as much as 90 pct of small-business loans granted by banks.

Such loans, Mr. Lucas explains, would be aimed at promoting the growth of new enterprises and providing existing firms with needed long-term capital when it cannot be obtained from other sources.

Mr. Lucas also proposes low cost, federally-financed technological studies in new product development. "Small business enterprises today are unable to maintain experimental laboratories," Lucas says, "In this respect they are at a serious disadvantage."

Orders 77 Diesel Locomotives

St. Louis—The Missouri Pacific R.R. has ordered 77 new diesel-electric locomotives at a cost of \$11,269,700.

The Missouri Pacific has been authorized by the Federal Court at St. Louis to purchase 35,640 net tons of rails and accessories to cost \$4,703,720 for its 1950 track program.

The rails, 4560 net tons of 132 lb weight and 31,180 net tons of 115 lb, will cost \$2,619,579. The other track material will cost \$2,084,141.

Installing Reynolds Equipment

Los Angeles—Final equipment in the 25,000 sq ft foil converting plant of the new Los Angeles division of Reynolds Metals Co. is being installed.

The plant, headed by L. B. Ward, now is equipped to take aluminum coils and laminate, emboss and process them into salable foil. It began operation here last year.

Discuss Direct Application Of Titanium Enamel to Steel

Philadelphia—Application of titanium enamel direct to steel was the feature subject discussed by experts at meetings of the Eastern Enameler's Club and the Central District Enameler's Club held Dec. 3 and Jan. 27 respectively.

The board of experts included J. B. Simons, enameling superintendent; R. F. Bisbee, manager of quality control; and C. L. Van Derau, works manager of the Westinghouse Mfg. Co., Mansfield, Ohio. The company is a pioneer in the use of titanium enamels direct to steel.

Among the points covered in the discussion were a history of Westinghouse research work and standardization to reduce thickness of vitreous enamel, a brief description of the characteristics of titanium steel compared to regular vitreous enameling iron and a summary of the problems encountered in developing the process of applying titanium enamel directly to steel.

In addition to the Westinghouse experts, Mr. Frank R. Porter of Inland Steel Corp. gave a brief description of the new titanium steel "Ti-Namel."

Hearings Postponed On Steel Companies' Price Rises

Washington—Further congressional hearings on price rises put into effect by steel companies during December and January will probably be held late this month.

Postponement of the originally scheduled date of Feb. 14 was announced by Rep. Celler, D., N. Y. He explained that conflicting schedules of the House judiciary committee and steel company officials made it impossible to meet the earlier schedule.

Meanwhile, Celler's committee held hearings this week on a bill requiring the Justice Dept. to make periodic reports on the consent decrees and nolo contendere pleas involved in federal antitrust proceedings.



George F. Sullivan



William V. Packard



William A. Phair

New York—George F. Sullivan has been appointed Managing Editor of THE IRON AGE. He replaces William A. Phair, who last week was named Editor of *Hardware Age*, another Chilton publication. At the same time, William V. Packard was made News-Markets Editor, IRON AGE.

Mr. Sullivan has been with THE IRON AGE since 1942, except for a period of war service. After serving in Pittsburgh as Regional Editor, he came to New

York last summer to assume the position of Markets Editor.

Mr. Packard came to THE IRON AGE in 1947 from the position of newspaper publisher in Lamar, Mo. After serving in various positions, he was named News Editor last June.

Before joining *Hardware Age*, Mr. Phair had been associated with THE IRON AGE for the past 13 years, except for war-time service. He had served as Technical Editor before becoming Managing Editor.

Reports Business Holding Up

Los Angeles—Continued good business was indicated by North American Aviation, Inc., as it reported that its backlog had remained virtually the same during the final three months of 1949.

Sales for the latest period totaled approximately \$5 million greater than the comparable 1948 period.

Preliminary net income for the three months, which were the first of the North American fiscal year, were \$1,390,000, equal to 40¢ a share.

Blaw-Knox Forms New Dept.

Pittsburgh—Blaw-Knox Co. has formed a chemicals and fuels synthesis department to deal with the conversion of fuels into chemicals. This work will be based initially on the Fischer-Tropsch synthetic fuels process and on related processes for making synthesis gas.

Blaw-Knox has just completed agreement with Ruhrchemie and Lurgi for licenses and access to all process information developed by these German firms.

Cracking Plant Eliminated From English Refinery Plans

Washington—Revised plans for the Shell Haven oil refinery to be constructed near London have eliminated a proposed catalytic cracking plant and have reduced the potential capacity from 66,000 to 40,000 bbl a day.

Under the new plans, cost of the project has been reduced to about \$34 million, of which Marshall Plan financing will amount to approximately \$2.5 million.

This latter amount will be used for purchase of such North American equipment as pumps, valves, fittings, piping, cranes, etc., and engineering services. About \$704,000 has already been allotted for engineering services.

Canadian Producers Revise Steel Prices

Both base prices and extras affected . . . Some base prices are lower . . . But U. S. extras apply . . . Action raises the total cost to Canadian consumers, aids British sales.

Toronto—Canadian steel mills have changed some base prices and adopted United States extras on all steel items.

Base prices of hot-rolled sheets have been cut from \$3.85 to \$3.65 per 100 lb and steel plate from \$3.95 to \$3.85. Bars have been marked up \$5 per ton to the new base of \$3.75 per 100 lb in car lots. All prices are f.o.b. Hamilton.

Price changes have been announced by the Steel Co. of Canada Ltd., Dominion Foundries & Steel Ltd., Hamilton, and Dominion Steel & Coal Corp., Sydney, N. S. It is understood that Algoma Steel Corp. will make a similar announcement within a few days.

Higher Costs for Consumers

No price change has yet been made on cold-rolled strip and galvanized sheets, although the latter is thought to be under consideration.

Although base prices have been

lowered on some items, adoption of the U. S. list of extra charges will mean higher steel costs for Canadian consumers. Higher prices for steel from domestic companies and U. S. mills will tend to throw a much greater volume of buying to British mills. They already have a substantial advantage due to devaluation of the pound. Several large orders have recently been placed with British firms.

Demand at High Level

Demand for steel in Canada is holding at a high level. Mills are booked solid on production for the first quarter but have not yet opened their second quarter books. However, it is expected that second quarter bookings will equal those for the first.

Although most producers expect business to remain high for the first half of the year, it is hard to get opinions on the outlook for the second half. Those who are

willing to hazard a guess seem to feel that they will not be able to hold their sales at current high levels throughout the year.

Canada May Lift Import Controls on Primary Shapes

Ottawa—Canadian import controls on primary steel shapes, under the Emergency Exchange Conservation Act, will be lifted at the beginning of February, according to reliable information.

While the final decision has still to be made, it is probable that starting Feb. 1, blanket permits will be issued for the import of primary steel shapes which were put under control last October. The blanket permit system is an effective means of decontrol but allows the control to be easily reinstated if necessary. It probably will be continued until import control on primary steel eventually disappears entirely.

It is doubtful that a single ton of steel has been kept out of Canada by the Control imposed Oct. 1. At that time the policy laid down was that permits would be granted for any steel shapes from the U. S. which were not available from Canadian mills.

Johnson and Jennings Co. Purchased by Chicago Concern

Cleveland—The Pettibone Mulliken Corp. has purchased Johnson & Jennings Co., Cleveland. The purchase included Johnson & Jennings' Oeco Division, vent valves, flame arresters, gages, swing lines and other tank equipment. The entire finished inventory of Oeco products has been moved to the Pettibone Mulliken Corp.'s 30-acre plant in Chicago.

The company announced that Oeco products will gain the advantage of enlarged engineering and development departments, laboratory and testing facilities and improved manufacturing techniques.

George Fox, sales manager, and certain engineering and production personnel, have been moved



SCRAP PREPARATION: Slag ladle buttons, spills, and off-heat ingots are cut to furnace charging size with speed and efficiency with this cutting blowpipe. The blowpipe, an Oxweld C-60 with powder-cutting attachment, is mounted on a machine carriage. In turn, this equipment is mounted on a gantry set-up, which makes transverse cutting operations possible over the entire cutting bed. With this arrangement, scrap handling is kept to a minimum.

to Chicago. The company will be known as the Johnson & Jennings Co. division of Pettibone Mulliken Corp.

Magnetic Materials Developed

Pittsburgh—Westinghouse Electric Corp. has developed two magnetic core materials for transducer applications—Hipersil and Hipernik V—at its Sharon and East Pittsburgh, Pa., plants.

The materials are particularly suited for electronic applications such as magnetic amplifiers, saturable reactors, and the new type of contact rectifiers.

Carter Named Chairman Of Pittsburgh Steel; Adams, President

Pittsburgh—Joseph H. Carter has been elected chairman and chief executive officer of Pittsburgh Steel Co., effective Mar. 1.



Avery C. Adams

Succeeding Mr. Carter as president is Avery C. Adams, who has been executive vice-president of Detroit Steel Corp., and formerly vice-president in

charge of sales and a director of U. S. Steel Corp.

Mr. Adams, 52, has resigned his position with Detroit Steel and will assume the presidency of Pittsburgh Steel Co. on Mar. 1.

Mr. Carter, 56, joined Pittsburgh Steel in 1936 as general superintendent of the Monessen Works. He started his steel career as a slagger in the old Youngstown Iron & Steel Co., Lowellville, Ohio, later purchased by Sharon Steel Corp. He was elected president of Pittsburgh Steel in 1942.

Mr. Adams started out as a laborer in the openhearth department of Trumbull Steel Co., Warren, Ohio, later merged with Republic Steel Corp., in 1919. He successively held executive positions with General Fireproofing Corp., Carnegie-Illinois Steel

Corp., Inland Steel Co. and U. S. Steel Corp., where he served as vice-president in charge of sales and as a director from Aug. 1, 1939 until late 1945. Until Feb. 14, 1949, when he became vice-president and a director of Ports-

mouth Steel Co., Portsmouth, Ohio, he was a partner in a New York steel exporting firm. When Portsmouth was purchased by Detroit Steel, Mr. Adams was made executive vice-president and a director of Detroit Steel.

U. S. Steel's Earnings "Satisfactory"

Boost common dividend to 65¢ a share . . . Strike causes changes in reporting fourth quarter profit . . . Strike cost \$30 million . . . Corporation had 35-day coal supply.

New York—Despite a 6-week strike during the fourth quarter "satisfactory" earnings for U. S. Steel Corp. during the past year were reported by Irving S. Olds, chairman, at a press conference here last week.

He reported income for 1949 of \$165,958,806, or a return of 7.2 pct on sales, compared with 1948 income of \$129,627,845, a return of 5.2 pct on sales. The 1949 earnings were equal to \$5.39 a common share, compared with \$4 a share the previous year.

Boost Dividends on Common

Dividends on common stock were boosted to 65¢ a share from 50¢. They are payable Mar. 10 to shareholders of record Feb. 10. The regular quarterly dividend of \$1.75 a share of preferred stock is payable Feb. 20 to shareholders of record Feb. 6.

Mr. Olds stressed that the dividend on common stock is a reflection of last year's earnings (the highest in 20 years) and aren't necessarily an indication of future payments.

Fourth quarter income was \$32,735,397. This would have been reported as \$6.7 million but for accounting adjustments which had to be made because of the strike. These adjustments were caused by two things: (1) Changes in computing accelerated depreciation as a result of the lowered operating rate and (2) sales from inventories.

Depreciation Becomes Profit

Accelerated depreciation is figured on a graduated scale in relation to the excess in annual operating rate over 70 pct of capacity. Depreciation for the first 9 months had been figured on the basis of an operating rate of 94.6 of capacity. Had the rate remained near that figure depreciation for the year would have been \$44 million.

But the strike cut the rate for the year to 82.5 pct, and accelerated depreciation for the year amounted to only \$22 million. Thus, \$16 million which had already been shown as cost of accelerated depreciation in the first

Turn to Page 108

STEEL COMPANY EARNINGS—1949 AND 1948

Company	Fourth Quarter '49	Fourth Quarter '48	1949 12 Months	1948 12 Months
U. S. Steel Corp.	\$32,735,397	\$41,510,274	\$165,958,806	\$129,627,845
Republic Steel Corp.	10,784,449	16,628,594	46,142,323	46,438,382
Jones & Laughlin Steel Corp.	922,327	10,973,134	20,961,245	31,222,451
National Steel Corp.	3,394,457	12,920,071	39,311,269	40,121,506
Youngstown Sheet & Tube Co.	3,219,019	16,145,264	31,777,010	35,711,732
Keystone Steel & Wire Co.	1,845,756	922,350	3,112,411*	1,782,588*
Crucible Steel Co.		1,404,880	1,330,000	3,596,177 ¹
Thomas Steel Co.	205,125	443,654	1,135,070	1,801,146 ¹

* Six months.

Other earnings reported February 2, page 117.

Viewing the News from

The ECONOMIC SIDE

By JOSEPH STAGG LAWRENCE

**"The Treasury Spigot
Must Be Kept Open"**

LAST January, last July, and at various points in between and since, the President has proclaimed a new approach to the great problems of enduring peace and prosperity. This new approach carries the label "Point Four." Its appeal is both impressive and intoxicating, for some of our better known liberals have already gone off the deep end in unconfined ecstasy.

Point Four holds that the tensions of the world which cause social unrest and provoke the aggression of ambitious powers are due to poverty. If, through a miracle of statesmanship and generosity, entirely within the realm of possibility, this country could promote rising living standards in the backward areas of the world, these tensions would disappear. The world would then enjoy peace and good will instead of strife and envy.

This object could be realized by making American technological know-how available to our more retarded global neighbors. If such expert opinion indicated the need for capital, this would come forth from private sources. With rising incomes, the beneficiaries of our advice—and capital—would become our good customers, thus opening another vista of American growth. Bread cast upon the waters, etc.

Such an idyllic prospect, even when introduced by the most august sponsors, must submit further details. How much money will be needed by our lagging contemporaries in order to achieve the laudable objectives of Point Four? The authors of the scheme are understandably vague on this point. However, one of the more ardent supporters, a bleeding heart in the topmost echelon of the "liberals," thinks that the plan might start off "modestly" with a half billion a year, reaching

an annual volume of six billion within a matter of 4 or 5 years.

This same supporter—and he is typical of the zealots who have gathered about the new standard—deplored the stingy dimensions of the Marshall Plan. He termed the billions paid out of the pockets of American taxpayers' "bargain basement diplomacy." Instead of a bold and farsighted program, with funds adequate to do the job, i.e., sixty to seventy billions, we tried to do the job with a few miserable billions. Penny-pinching penury instead of courageous vision.

The Kee Bill, the Administration version of Point Four, is careful not to mention amounts. The bill lets the cat out of the bag by mentioning in the preamble that one of the objects is "to promote the foreign policy of the United States." At another point it innocently mentions that foreign applicants unable to get necessary advice and financial help on "reasonable terms" can make appointments with the White House.

The Herter Bill provides government guarantees for private capital (willing to stick its neck out) against losses by expropriation or exchange skulduggery, realizing that no American owner of capital in his right mind will expose his funds in other parts of the world when he can do much better at home with less risk.

Point Four has all the earmarks of another scheme to tap the Treasury for vast funds to be spent in foreign areas whose governments prefer chiseling to fair play.

In the past, capital—large amounts of it—has moved freely across borders to help economic growth wherever it had assurance of fair treatment, reasonable safety, and competitive profit. No Point Four was necessary. None is necessary today.

U. S. Steel Earnings

Continued from Page 107

9 months had to be reported as income in the fourth quarter.

Inventory Becomes Profit

Normal inventory quantities couldn't be maintained because of the strike. Many inventories had to be reduced below normal level. Because of "last-in first-out" inventory pricing practice these items were carried at 1940 cost levels. Internal Revenue regulations forced these inventory reductions to be shown as income of \$17 million during the fourth quarter. Federal taxes on this were \$7 million. This \$17 million is excess of current cost of liquidated inventories over the amount carried in the accounts. This is not true profit because \$17 million will have to be spent, at current prices, to replace this inventory.

Strike Cost \$30 Million

Mr. Olds said the strike cost his company \$30 million "out-of-pocket" expense. This doesn't include loss of potential profit, nor does it include cost to the union and the individual workers.

He estimated that the U. S. Steel ore body in Venezuela is "somewhere in the neighborhood of a billion tons." Based on test drilling, this is believed to be 65 pct iron with only 3 pct silica. There is no overburden. Shipments of this ore are expected to start within 5 years.

The corporation has noted increased competition from foreign steel producers. But Mr. Olds said demand is still good. "Devaluation has helped some sell cheaper than us . . . but we're able to out-sell others on the basis of quality and service." About 6 pct of 1949 output was exported, compared with 5.3 pct in 1948.

Commenting on the outlook for this year, Mr. Olds said demand is very strong now. The current backlog on a tonnage basis is equal to 4½ months' output. He expects good business through the first half and believes that shipments this year might be expected to be about like last year.

Hotpoint Tells Plans For Chicago Refrigerator Plant

Chicago—Hotpoint, Inc., has announced plans for construction of a large new plant in Chicago for the manufacture of electric refrigerators. The plant will be completed within 15 months and will attain full production three months later.

It will contain approximately a million square feet of floor area, and will be planned for an annual production of 400,000 units. Cost of the project has not been revealed, however, the plant will be roughly equivalent in size and tooling to Hotpoint's electric range plant, completed in 1948, which represented a total investment of approximately \$12 million.

Production at the new plant will require an estimated 60,000 tons of steel a year.

Aluminum Group Chooses Leaders at Annual Conclave

New York—At the annual meeting of The Aluminum Assn., R. S. Reynolds, Jr., Reynolds Metals Co., was elected president.

The following were elected vice presidents: E. G. Grundstrom, Advance Aluminum Castings Corp., Chicago; M. E. Rosenthal, United Smelting and Aluminum Co., Inc., New Haven, Conn.; and George N. Wright, The John Harsh Bronze and Foundry Co., Cleveland. A. V. Davis, Aluminum Co. of America, was re-elected chairman of the board, and Donald M. White was reappointed secretary and treasurer.

Directors-at-large

Three directors-at-large were elected to serve for three-year terms: A. P. Cochran, Cochran Foil Co., Inc., Louisville, Ky.; D. A. Rhoades, Kaiser Aluminum & Chemical Corp., Oakland, Calif.; and R. J. Roshirt, Bohn Aluminum & Brass Corp., Detroit.

John T. Watry, Aluminum Casting & Engineering Co., Milwaukee, was elected chairman of the

foundry division; Louis Fischer, Fischer Casting Co., North Plainfield, N. J., was elected vice chairman; and H. J. Hater, of Aluminum Industries, Inc., Cincinnati, was appointed to represent the division on the association's board of directors.

Sheet Division Chief

L. M. Brile of Fairmont Aluminum Co., Fairmont, W. Va., was elected chairman of the sheet division, and George M. Carter, of the Sheet Aluminum Corp., Jackson, Mich., was named to represent the division on the board of directors. Harold C. Wilson, Revere Copper and Brass, Inc., Baltimore, was elected chairman of the extruded products division.

Produced 111 Barge Hulls in '49

Pittsburgh—Dravo Corp. launched a total of 111 hulls for river and harbor vessels at its Neville Island (Pittsburgh) and Wilmington, Del., shipyards during 1949.

Petroleum barges, numbering 44, led the list. Other types included sand and gravel barges, coal barges, covered hopper barges, deck barges, grain barges and one dredge hull.



"My advice, Filbert, is to go right back in again before you lose your nerve."

Diamond Alkali Gets New Furnace for Silicate Plant

Cleveland—Diamond Alkali Co. has put into full-scale operation a new 50,000-ton furnace at its Cincinnati silicate plant. W. H. Evans, Diamond's general manager of silicate operations, said addition of the new furnace will increase production of silicate of soda and related products at the Cincinnati plant by 50 pct.

The plant now will have three 50,000-ton furnaces. The furnace building was approximately enlarged and remodeled. Total cost of the expansion project was \$300,000. The Cincinnati plant, of which E. J. Feighery is plant manager, is one of six silicate plants operated by Diamond Alkali.

Eastern States Steel Erects Warehouse for New England Area

Brockton, Mass.—Eastern States Steel Products Co. has completed erection of a new steel warehouse here to supply steel consumers in the New England area. The company reports that it is also broadening its sales force.

The new warehouse is equipped with an electric crane and a variety of processing machinery. Storage facilities will be equipped to handle hot-rolled bars, rounds, flats, squares, angles, channels and beams, steel plates, sheets, galvanized sheets, aluminum, copper and other items.

Production Experts Visit U.S.

Washington—Four German gas production experts will visit gas companies, coal crushing and mixing plants, and inspect pipelines to study American methods of distribution, manufacture and the uses and manufacture of appliances.

At the same time, another Marshall Plan technical assistance project will bring two British experts to this country. One will study gas turbine development for six weeks and the other will assist in a year-long experiment on the underground gasification of coal.

Construction Steel Awards

Fabricated steel awards this week included the following:

- 1565 Tons, Needham, Wellesley, Newton and Weston, Mass., 7 bridges and viaduct, Route 128, circumferential highway. Completion date Nov. 1, 1950. Fred D. Sabin, Cambridge, Mass., district engineer, through V. Barletta Co., Roslindale, Mass., to American Bridge Co., Pittsburgh.
- 1250 Tons, Schuylkill County, Pa., bridges, Pennsylvania Dept. of Highways, to Bethlehem Steel Co., Bethlehem.
- 1230 Tons, Cook County, Ill., Eden's Parkway overpass section 263-0707.1, Arcola Midwest Corp., low bidder.
- 675 Tons, Washington, D. C., renovation of Executive Mansion, to Bethlehem Steel Co., Bethlehem.
- 450 Tons, Bronx, N. Y., Hunts Point sewage treatment works, Dept. of Public Works, to Grand Iron Works, Inc., N. Y.
- 295 Tons, Northampton County, Pa., bridge, LR 8019 Spur 1, Pennsylvania Dept. of Highways, to Bethlehem Steel Co., Bethlehem.
- 195 Tons, Wheeler, Wash., Bureau of Reclamation, bridge to American Bridge Co., Pittsburgh.
- 190 Tons, Denver, structural steel for railway bridges at East Low Canal, Columbia Basin Project, Bureau of Reclamation Spec. 2877, to American Bridge Co., Gary, Ind.
- 175 Tons, Sheboygan, Wis., R-Way Furniture Co., building to Wisconsin Bridge & Iron Co., Milwaukee.
- 170 Tons, Schuylkill County, Pa., beam bridges, Reading Co., to Phoenix Bridge Co., Phoenixville, Pa.
- 100 Tons, Berks County, Pa., Route 06023(1), bridge, Pennsylvania Dept. of Highways, to Bethlehem Steel Co., Bethlehem.

Fabricated steel inquiries this week included the following:

- 925 Tons, Eugene, Ore., Lookout Point reservoir structures, Portland District Corps of Engineers, Ser. CIVENG-35-026-50-250. Bids to Apr. 20.
- 200 Tons, Cleveland, New York Central Railroad bridge. Bids due Mar. 1.
- 200 Tons, Hinsdale, Ill., high school auditorium. Bids due Feb. 15.
- 135 Tons, Danvers, Mass., 2 span steel stringer bridge at Maple St. on Newburyport Turnpike, and approaches. C. A. Fritz, Beverly, Mass., district engineer. Completion date, Dec. 1, 1950.
- 135 Tons, Tucson, Ariz., bridge on St. Mary's Road at crossing of Santa Cruz River, State Highway Commission, Phoenix, Ariz. Bids to Feb. 10.
- 120 Tons, Adams County, Colo., bridge on State Highway 8 near Watkins, State Highway Dept., Denver. Bids to Feb. 15.
- 120 Tons, Lincoln, Mass., 3 span steel stringer bridge, concrete deck and macadam approaches. Fred D. Sabin, district engineer. Completion date, Oct. 31, 1950.
- 100 Tons, Chester County, Pa., construction of an I-beam highway underpass bridge. Secretary of Highways, Harrisburg, Pa. Bids to Feb. 24.

Reinforcing bar awards this week included the following:

- 860 Tons, Needham, Wellesley, Newton and Weston, Mass., 7 bridges and viaduct, Route 128, circumferential highway, through V. Barletta Co., Roslindale, Mass., to Bethlehem Steel Co., Bethlehem.
- 600 Tons, Allegheny County, Pa., Pennsylvania Turnpike sections 31D and 31E, to U. S. Steel Supply Co., Chicago.
- 110 Tons, Gambier, Ohio, Kenyon College building to Bethlehem Steel Co., Bethlehem.

110 Tons, Dover, Ohio, Union Hospital addition to Truscon Steel Co., Cleveland.

Reinforcing bar inquiries this week included the following:

- 1490 Tons, Eugene, Ore., Lookout Point reservoir structures, Portland District Corps of Engineers, Ser. CIVENG-35-026-50-250. Bids to Apr. 20.
- 975 Tons, Chicago, Kostner Ave. Sewer contract 2A.
- 510 Tons, Los Angeles, improvements to Live Oak Wash, Los Angeles District Corps of Engineers, Ser. CIVENG-04-353-50-28. Bids to Feb. 28.
- 490 Tons, Cleveland, Tuberculosis Hospital.
- 400 Tons, Pittsburgh, new vinegar building for H. J. Heinz.
- 330 Tons, Pittsburgh, Pennsylvania Railroad freight building.
- 230 Tons, Eugene, Ore., relocation Southern Pacific RR and State Highway 58 Lookout Point Dam, Portland District Corps of Engineers. Bids to Mar. 15.
- 220 Tons, Chicago, Presbyterian Hospital nurses home.
- 215 Tons, Urbana, Ill., University of Illinois veterinary medicine building.
- 195 Tons, Montgomery County, Pa., construction of an I-beam bridge. State Highway and Bridge Authority, Harrisburg, Pa. Bids to Feb. 24.
- 195 Tons, Ames, Iowa, Agronomy Building for University of Iowa.
- 150 Tons, Dubuque, Iowa, water plant.
- 120 Tons, Burlington, Mass., 2 bridges and bituminous concrete surfacing.
- 120 Tons, Barnstable, Mass., 3 concrete frame bridges with bituminous concrete approaches and bituminous macadam service road. Lewis R. Sellow, Middleboro, district engineer. Completion date July 31, 1950.
- 105 Tons, Oil City, Pa., printing plant for Derrick Publishing Co.

Approve Marshall Plan Aid For Proposed Italian Power Plant

Washington—Marshall Plan assistance amounting to \$6.5 million has been approved for the proposed SIP power plant to be constructed near Turin, Italy.

Plans installation of a 50,000-kw turbo-generator and related accessories. It is expected to eventually expand capacity to 200,000 kw.

This authorization brings the cumulative total of Marshall Plan authorizations, through Jan. 20, to about \$8.1 billion.

Report New Source Of Electro-Galvanized Strip

Los Angeles—California Cold Rolled Steel Corp. announces that it is now carrying electro-galvanized strip in various thicknesses and that it can supply that material in various widths suitable for drawing, forming or stamping.

Construction Industry Sets New Record for January

Washington—Construction for 1950 was off to a good start by reaching a new January high of \$1.5 billion. This is 16 pct above 1949's January total, according to Commerce Dept. figures.

Industrial Construction Down

Private financing is 14 pct above a year ago, although somewhat less than in Dec., 1949. Public expenditures for building also showed an increase, about 24 pct, from last year and accounted for \$360 million of the total.

Industrial construction, continuing a slight month to month decline, is below a year ago. Commercial construction showed a decline from last year but is holding up well at about \$100 million for the month. Housing at \$650 million accounted for more than half the January total.

Bethlehem Prospecting For Iron Ore in Berks County, Pa.

Philadelphia—Bethlehem Steel Co. has bought land in Berks County, Pa., to prospect for iron ore. A statement by Bethlehem followed reports of test drilling near Morgantown, Pa., in the southern end of the county.

Bethlehem admitted that they are interested in prospecting in that general area, and that they have acquired some land on which exploratory work is being done.

"This is a continuation of a general program of prospecting in the vicinity of former workings in this area for ore occurrences. The drilling to date has shown some ore, but nothing conclusive as to quantity or quality."

Reports from that area indicate that in the past 8 months Bethlehem has bought 1500 acres of land for about \$350,000. The present drilling is much deeper than that which was done in the past.

MARKET

IRON AGE
FOUNDED 1855
MARKETS & PRICES

Briefs and Bulletins

coal board—On Monday President Truman appointed a board of inquiry under the Taft-Hartley Law in a last-ditch effort to restore full coal output. The board was ordered to report back by Feb. 13, but may report sooner. It can only report facts, not recommend. Members of the board are: David L. Cole, Paterson, N. J., lawyer and member of the steel fact-finding board; William Wirtz, Northwestern University; and John Dunlop, Harvard University.

more c-r sheets—Carnegie-Illinois Steel Corp. is increasing output of cold-rolled sheets by about 200,000 tons a year in the Chicago district. The program will be completed in about 15 months. At the Gary Sheet & Tin Mill existing temper mills and pickling lines will be modernized and an additional shear line installed. The 36-in. slabbing mill at Gary Steel Works will be revamped with installation of modern soaking pits, an ingot stripper, and mill auxiliary equipment.

mill motor contract—Westinghouse Electric Corp. has been awarded a \$400,000 contract by E. W. Bliss Co., Salem, O., for motors and auxiliary equipment for a single-stand strip mill being built for Cantieri Metallurgici Italiani, of Italy. Mill is designed either for cold-reducing or as a non-reversing temper pass mill.

pig iron—Two pig iron producers in the Birmingham area have raised their prices \$3 a ton to meet the recent price increase of Republic Steel in that area. Sloss-Sheffield raised its prices on Feb. 3, while Woodward Iron Co. met the increase Feb. 4.

raise coke prices—Several coke producers in the Midwest and South have advanced their coke prices \$1 a ton. The increases were made to cover higher costs of coal as well as to block efforts to hoard vital coal and coke supplies.

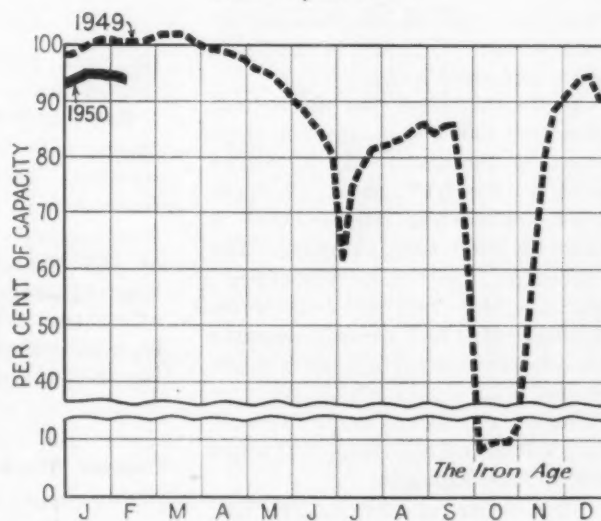
alloy bar extras—Extra charges by American Steel & Wire Co. on cold-finished alloy bars amounted to increases averaging \$1.50 per net ton. Base price increase was \$5 per ton.

steel's payroll—Total payroll of the iron and steel industry last year was the second highest in history—\$2,061,770,000. And average hourly wage rates were the highest ever recorded, according to the American Iron and Steel Institute. The 1949 payroll was topped only by that of 1948 which totaled \$2,234,461,000. The payroll during the first 9 months this year was higher than ever before, but the strike during October and November lowered the year's total. Average hourly earnings last year were \$1,703, compared with \$1,629 during 1948.

shades of 1949—Some steel circles do not share Detroit's optimism on the future course of demand for automobiles. They think soft spots are already beginning to show up in the auto market. But the people who make autos are still confident of a big year. Ford and GM have big plans to make cars in record numbers while Chrysler is strike-stalled. The auto people were right last year. Will history repeat itself?

lets contract—Detroit Steel Corp. has awarded General Electric Co. a \$2 million contract for electrical equipment for the new hot-rolled strip mill which is expected to be installed at Portsmouth, O., by November. An electric-weld pipe mill will follow the strip mill installation.

Steel Operations



District Operating Rates—Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
January 29	96.5*	99.0*	88.0*	80.5	100.0	101.5	102.5	103.0	107.0*	91.5	84.5	89.0	91.0	93.5*
February 5	96.5	98.0	85.5	79.0	99.6	101.5	102.5	96.0	101.0	87.0	82.5	87.0	95.9	91.0

* Revised.

February 9, 1950

Nonferrous METALS OUTLOOK

Market Activities

Tin market reaching stabilization level . . . Backwardation only $\frac{3}{8}\epsilon$. . . Strike ends at Laurel Hill . . . Selby smelter still on strike . . . Copper business continues heavy.

by

John Anthony

New York—Early this week the tin market appeared to be settling down to a stabilization level. Importers and brokers here have made no recent reductions in price. In fact they advanced the prompt price by $\frac{1}{8}\epsilon$ last week and are now only $\frac{1}{8}\epsilon$ below the RFC price. So far RFC has made no further reduction below the $74\frac{1}{2}\epsilon$ price put into effect on Jan. 30. Backwardation is now only $\frac{3}{8}\epsilon$, a reduction from last week's $\frac{5}{8}\epsilon$.

It is understood that the British Ministry has a consignment shipment on the water which will be sold at the RFC price. Brokers here hazard the opinion that it may be 1000 tons or more. The market is inactive, buyers expecting to find further reductions. Whether this will develop depends on whether importers find themselves with stocks which must be reduced in order to move them off the docks rather than to incur warehouse charges.

The strike at the Laurel Hill refinery ended on Monday. Workers returned on the morning shift. The contract is not reopenable for any reason until June 1951. A wage increase was granted of 5ϵ an hr, retroactive to Jan. 1. There was no pension or insurance clause in the agreement. It is understood that the El Paso, Tex., and Doug-

las, Ariz., plant negotiations were settled on the same basis.

The only remaining strike in the industry is at the Selby, Calif., smelter. This strike cuts into western lead supplies, but it has been learned in the trade that most of the western consumers have been covered. This strike won't affect the eastern market. It is learned that there have been some requests for shipment of Peruvian lead to this area.

Copper Market Is Strong

The copper market is still going strong. The last figure releases indicate that sales during January were 118,300 tons. Sales for shipment during the month were 118,200 tons. Sales so far in February were 24,000 tons. Sales for shipment in February are 71,000 tons.

The brass mills are still going strong on copper products. Copper

sheets are very good. Tubing is only fair. Brass products are not in heavy demand. Wire mills are reported to be operating at about 75 pct of capacity.

Lead consumers continue to buy on a hand to mouth basis. Sales of lead are fairly good to the domestic market but there is no foreign business. Foreign consumers won't buy dollar lead while they can still get sterling lead. British consumers could use more lead than they have been getting, but the economic condition of the country is forcing an austerity program in lead buying. Industry sources say that foreign lead is not finding many buyers in the domestic market because buyers require immediate delivery.

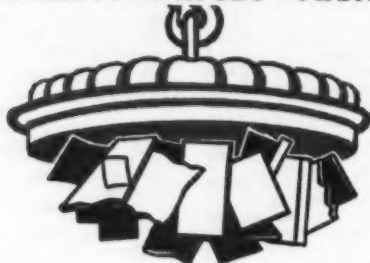
The January average price of zinc at New York published in last week's issue should have been 10.483¢ per lb.

NONFERROUS METALS PRICES

	Feb. 1	Feb. 2	Feb. 3	Feb. 4	Feb. 6	Feb. 7
Copper, electro, Conn.	18.50	18.50	18.50	18.50	18.50	18.50
Copper, Lake, Conn.	18.625	18.625	18.625	18.625	18.625	18.625
Tin, Straits, New York	74.50	74.50	74.50	74.50	74.50	74.50
Zinc, East St. Louis	9.75	9.75	9.75	9.75	9.75	9.75
Lead, St. Louis	11.80	11.80	11.80	11.80	11.80	11.80

Note: Quotations are going prices.

MARKETS—PRICES—TRENDS



SCRAP

Iron & Steel

Steel Grades Are Firm, Prices Quiet

Steelmaking scrap prices, though quiet, are generally firm. No. 1 heavy melting steel advanced by 50¢ a ton at Pittsburgh. Railroad heavy melting steel was up \$1.00 a ton there to a top of \$33.00.

Mill emphasis is on quality scrap. Where the undertone is firm on No. 1 steel, No. 2 is soft. This is borne out by lack of movement in dealers No. 2 bundles as well and by the good prices for industrial and railroad lists. In some cases premiums are being paid for plant scrap. There are signs that the new emphasis on quality and specifications on the part of buyers and sellers is catching on.

The weak spots are in the cast grades. They are particularly soft in the East, where pipe foundry business is dull and demand is shot to pieces. Other foundry business is not too strong either and cast scrap is running counter to steelmaking and blast furnace trends.

PITTSBURGH—To some scrap men, the market this week was somewhat paradoxical. Sales to two mills established the price of No. 1 heavy melting at \$31.50, up 50¢. But the uncertain coal-labor situation injected a note of pessimism. If the miners are not back at work soon, the mills will accelerate shutdown of melting facilities with resultant lessening of demand for scrap. Railroad lists were stronger, with No. 1 RR. heavy melting up \$1 to a top of \$33.00.

CHICAGO—The scrap market in Chicago continued quiet, with prices firm. Though one large user of turnings and borings dropped out of the market, there was no evidence of weakness in prices for blast furnace grades of scrap. The closing of a railroad list last week again showed prices higher than Chicago area consumers are willing to pay, with most scrap bought for shipment out of town or by brokers who are apparently speculating.

PHILADELPHIA—Business has been continuing at the same low level of recent weeks. Small tonnages of steel scrap are moving. The cast market has weakened with heavy offerings of yard cast to pipe foundries. One pipe mill is back in the market again, buying several dollars below the previous level. Yard cast is quoted \$3 lower, and malleable \$1 lower. Other quotations remain unchanged.

NEW YORK—Prices on No. 1 heavy melting steel were stronger here on the

basis of recent sales in Pittsburgh. There was a brief flurry in turnings because of the coal strike. It took prices up by \$2 a ton for a few days but has now petered out. Reflecting some pipe foundry pessimism, cast grades were soft but only mixed yard cast dropped, falling 50¢.

DETROIT—The scrap market here continues to mark time in the absence of a settlement of the coal controversy. Detroit mills are out of the market at the moment and prospects for their early return are not considered to be favorable. Meanwhile, local industrial lists have showed some strength, indicating a good demand for top grade materials. Dealers' scrap, however, continues in secondary demand for the most part. Blast furnace grades are stronger and cast grades continue on the easy side.

CLEVELAND—Blast furnace grades are warming up in a spotty market here and in the valley. Premiums are being paid for plant scrap and there is more pressure on cast. A railroad got \$32.50 for No. 1 last week, and some automotive bundles, generated here, brought \$29.00 plus. Movement of dealer grades is limited, a fact some dealers find perplexing in view of the increased melt.

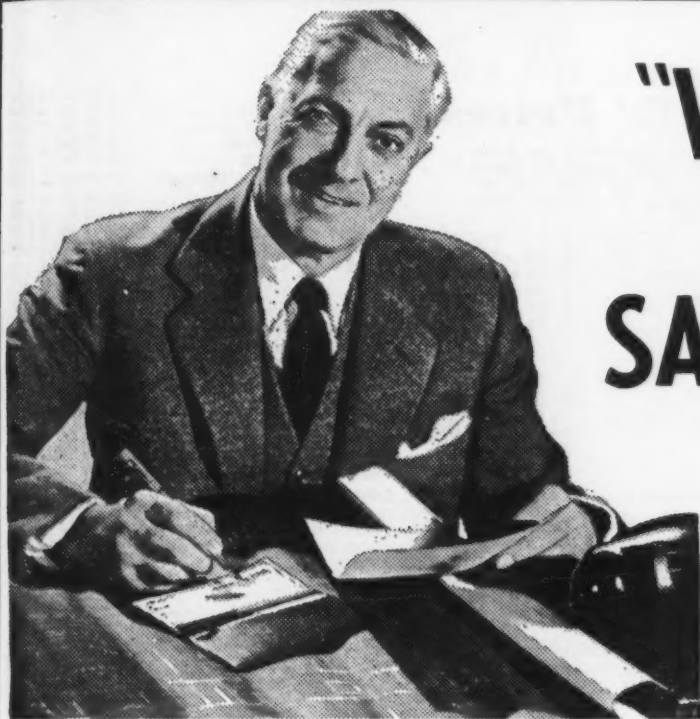
BOSTON—Business here is still running below normal with a weak undertone. The only change in steelmaking scrap came in No. 2 steel, off \$1.00 a ton. There is not much activity in cast scrap either, just enough to show further weakness in No. 1 and No. 2 machinery cast. The former is off \$2.00, the latter is off an average of 75¢.

BUFFALO—An improved tone is noted in the market for quality scrap. With ample material around to cover commitments, mills are getting results in their move to ban poor quality scrap especially tin cans, from bundles. Dealers likewise are being more careful in processing bundles to avoid rejections and double handling charges. The market however is still stalemated from a new business standpoint. Offerings are available but bids are still scarce. Prices are unchanged.

CINCINNATI—Supply of all grades continues to exceed demand in a relatively weak and unchanged scrap market here. Major item of concern is the flood waters of the Ohio River, which have forced one major consumer to hold up scrap shipments. Blast furnace grades are moving freely at quoted prices, and while most district consumers are comfortable inventory-wise, one consumer is buying a little tonnage.

BIRMINGHAM—Despite an increase in the prices of pig iron here prices are weaker for cast grades of scrap. Some tonnages of cast and blast furnace grades are being bought but there is no market at present for either open hearth or electric furnace material. Lack of demand and railroad freight rates have sharply curtailed shipments of scrap into this area from Florida points.

ST. LOUIS—The market continues inactive, steel mills having postponed buying until about March 1. Brokers seem to feel that the market will be stronger on the upper grades and weaker on lower grades. There was some buying of stove plate for Chicago interests, and prices were \$2 a ton higher.



"WE'RE ALL IN THE SAME BOAT"

Any condition that reflects on a few members of the scrap industry reflects on the industry as a whole at the same time . . . There have been numerous criticisms from mill personnel that too many cars of steel scrap have been received that are not in accordance with specifications for grades purchased.

A laxness on the part of yardmen, in most cases, allows non-metallics and foreign materials to be baled with scrap destined for mill shipment. Scrap of this sort is of course rejected by the mill because inferior quality means grief for the mill and produces nothing but losses all around.

A general slacking of vigilance on both the part of dealers and the mills has had a natural result—non-metallics and foreign materials that should be segregated (segregated material can be sold) find their way into mill shipments. A few cars get through and their contents mean "off heats" and slow downs in production — then the clamp down comes and because of the few, the many suffer . . . Inspections become more rigid and technical—everyone in the industry experiences more toss-outs and rejections. Rejected cars mean extra handling, extra time and extra expense for the mill and in turn mean a loss to the dealer—so everyone loses.

We, as an industry, must co-operate with America's mills—we must work together in this task of care in sorting and grading and keeping our scrap free of the elements that contaminate furnaces and kill production. Make sure that your yard is co-operating in this industry-wide effort.

*This Ad is a Public Service in the Interest of Better Scrap
for Better Steel*

**Yards: Glassport, Pa., Memphis, Tenn., McKeesport, Pa.
Crushing Plant: Glassport, Pa.**



SOUTHWEST STEEL CORP.

MAIN OFFICE: GRANT BUILDING

PITTSBURGH 19, PENNA.

Pittsburgh

No. 1 hvy. melting	\$31.00 to \$31.50
No. 2 hvy. melting	29.00 to 29.50
No. 1 bundles	31.00 to 31.50
No. 2 bundles	23.50 to 24.00
Machine shop turn.	21.00 to 21.50
Mixed bor. and ms. turns	21.00 to 21.50
Shoveling turnings	24.50 to 25.00
Cast iron borings	24.50 to 25.00
Low phos. plate	32.00 to 32.50
Heavy turnings	26.00 to 27.00
No. 1 RR. hvy. melting	32.50 to 33.00
Scrap rails, random lgth.	35.50 to 36.50
Rails 2 ft and under	39.00 to 40.00
RR. steel wheels	34.50 to 35.00
RR. spring steel	34.50 to 35.00
RR. couplers and knuckles	34.50 to 35.00
No. 1 machinery cast.	37.00 to 38.00
Mixed yard cast.	34.00 to 35.00
Heavy breakable cast.	29.00 to 30.00
Malleable	33.00 to 34.00

Chicago

No. 1 hvy. melting	\$27.00 to \$28.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 factory bundles	27.00 to 28.00
No. 1 dealers' bundles	25.00 to 26.00
No. 2 dealers' bundles	20.00 to 21.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	18.00 to 19.00
Low phos. forge crops	31.00 to 33.00
Low phos. plate	29.00 to 31.00
No. 1 RR. hvy. melting	29.00 to 30.00
Scrap rails, random lgth.	33.00 to 34.00
Rerolling rails	39.00 to 40.00
Rails 2 ft and under	38.00 to 39.00
Locomotive tires, cut	33.00 to 34.00
Cut bolsters & side frames	34.00 to 35.00
Angles and splice bars	35.00 to 36.00
RR. steel car axles	43.00 to 44.00
RR. couplers and knuckles	32.00 to 33.00
No. 1 machinery cast.	38.00 to 39.00
No. 1 agricul. cast.	37.00 to 38.00
Heavy breakable cast.	31.00 to 32.00
RR. grate bars	29.00 to 30.00
Cast iron brake shoes	30.00 to 31.00
Cast iron car wheels	36.00 to 37.00
Malleable	36.00 to 37.00

Philadelphia

No. 1 hvy. melting	\$22.50 to \$23.50
No. 2 hvy. melting	20.50 to 21.50
No. 1 bundles	22.50 to 23.50
No. 2 bundles	17.50 to 18.50
Machine shop turn.	16.00 to 16.50
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	17.00 to 17.50
Low phos. punchings, plate	25.50 to 26.50
Low phos. 5 ft and under	24.50 to 25.50
Low phos. bundles	24.50 to 25.50
Hvy. axle forge turn.	22.50 to 23.50
Clean cast chem. borings	28.00 to 29.00
RR. steel wheels	28.00 to 29.00
RR. spring steel	28.00 to 29.00
Rails 18 in. and under	37.00 to 38.00
No. 1 machinery cast.	36.00 to 38.00
Mixed yard cast.	30.00 to 31.00
Heavy breakable cast.	33.00 to 34.00
Cast iron carwheels	37.00 to 38.00
Malleable	37.00 to 38.00

Cleveland

No. 1 hvy. melting	\$28.00 to \$28.50
No. 2 hvy. melting	25.50 to 26.00
No. 1 busheling	28.00 to 28.50
No. 1 bundles	28.00 to 28.50
No. 2 bundles	22.50 to 23.00
Machine shop turn.	19.00 to 19.50
Mixed bor. and turn.	21.50 to 22.00
Shoveling turnings	21.50 to 22.00
Cast iron borings	21.50 to 22.00
Low phos. 2 ft and under	29.00 to 29.50
Steel axle turn.	27.00 to 27.50
Drop forge flashings	28.00 to 28.50
No. 1 RR. hvy. melting	32.00 to 32.50
Rails 3 ft and under	42.00 to 43.00
Rails 18 in. and under	43.00 to 44.00
No. 1 machinery cast.	42.00 to 43.00
RR. cast	42.00 to 43.00
RR. grate bars	30.00 to 31.00
Stove plate	34.00 to 35.00
Malleable	38.00 to 39.00

Youngstown

No. 1 hvy. melting	\$30.50 to \$31.00
No. 2 hvy. melting	27.50 to 28.00
No. 1 bundles	30.50 to 31.00

Scrap IRON & STEEL Prices

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

No. 2 bundles	\$24.50 to \$25.00
Machine shop turn.	20.50 to 21.00
Shoveling turnings	23.50 to 24.00
Cast iron borings	23.50 to 24.00
Low Phos. plate	31.50 to 32.00

Buffalo

No. 1 hvy. melting	\$27.50 to \$28.00
No. 2 hvy. melting	25.50 to 26.00
No. 1 busheling	25.50 to 26.00
No. 1 bundles	26.50 to 27.00
No. 2 bundles	24.00 to 24.50
Machine shop turn.	18.00 to 18.50
Mixed bor. and turn.	19.00 to 19.50
Shoveling turnings	20.50 to 21.00
Cast iron borings	19.50 to 20.00
Low phos. plate	29.00 to 29.50
Scrap rails, random lgth.	33.50 to 34.00
Rails 2 ft and under	38.50 to 39.00
RR. steel wheels	33.00 to 33.50
RR. spring steel	33.00 to 33.50
RR. couplers and knuckles	33.00 to 33.50
No. 1 machinery cast.	35.00 to 36.00
No. 1 cupola cast.	32.00 to 33.00
Stove plate	22.50 to 23.00
Small indus. malleable	30.00 to 30.50

Birmingham

No. 1 hvy. melting	\$25.00
No. 2 hvy. melting	24.00
No. 2 bundles	22.00
No. 1 busheling	24.00
Machine shop turn.	\$16.00 to 17.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	19.00
Bar crops and plate	28.00 to 29.00
Structural and plate	28.00 to 29.00
No. 1 RR. hvy. melt.	26.00 to 27.00
Scrap rails, random lgth.	29.00 to 30.00
Rerolling rails	33.00 to 33.50
Rails 2 ft and under	35.50 to 36.00
Angles & splice bars	34.00 to 35.00
Std. steel axles	28.00 to 29.00
No. 1 cupola cast.	34.00 to 35.00
Stove plate	29.00
Cast iron carwheels	28.00 to 29.00

St. Louis

No. 1 hvy. melting	\$29.00 to \$30.00
No. 2 hvy. melting	25.00 to 26.00
No. 2 bundled sheets	25.00 to 26.00
Machine shop turn.	15.00 to 16.00
Shoveling turnings	19.00 to 20.00
Rails, random lengths	30.00 to 31.00
Rails 3 ft and under	35.00 to 36.00
Locomotive tires, uncut	27.00 to 28.00
Angles and splice bars	34.00 to 35.00
Std. steel car axles	37.00 to 38.00
RR. spring steel	30.00 to 31.00
No. 1 machinery cast.	36.00 to 37.00
Hvy. breakable cast.	29.00 to 30.00
Cast iron brake shoes	27.00 to 28.00
Stove plate	27.00 to 28.00
Cast iron car wheels	34.00 to 35.00
Malleable	30.00 to 31.00

New York

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$20.25 to 20.75
No. 2 hvy. melting	17.50 to 18.00
No. 2 bundles	16.00 to 16.50
Machine shop turn.	10.50 to 11.00
Mixed bor. and turn.	10.50 to 11.00
Shoveling turnings	11.50 to 12.00
Clean cast chem. bor.	23.00 to 24.00
No. 1 machinery cast.	27.50 to 28.50
Mixed yard cast.	26.00 to 26.50
Charging box cast.	26.50 to 27.00
Heavy breakable cast.	26.50 to 27.00
Unstrp. motor blocks	22.00 to 23.00

Boston

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$18.50 to \$19.50
No. 2 hvy. melting	15.50 to 16.00
No. 1 bundles	18.50 to 19.50

No. 2 bundles	\$14.00 to \$14.50
Machine shop turn.	9.50 to 10.00
Mixed bor. and turn.	9.50 to 10.00
Shoveling turnings	12.00 to 12.50
No. 1 busheling	16.50 to 17.00
Clean cast chem. borings	18.00 to 18.50
No. 1 machinery cast.	25.50 to 27.00
No. 2 machinery cast.	21.00 to 22.00
Heavy breakable cast.	22.00 to 23.00
Stove plate	22.00 to 23.00

Detroit

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$21.00 to \$22.00
No. 2 hvy. melting	19.00 to 20.00
No. 1 bundles	23.00 to 24.00
New busheling	22.00 to 23.00
Flashings	22.00 to 23.00
Machine shop turn.	14.00 to 14.50
Mixed bor. and turn.	14.00 to 14.50
Shoveling turnings	15.50 to 16.00
Cast iron borings	15.50 to 16.00
Low phos. plate	22.00 to 23.00
No. 1 cupola cast.	31.00 to 32.00
Heavy breakable cast.	25.00 to 26.00
Stove plate	26.00 to 27.00
Automotive cast.	34.00 to 35.00

Cincinnati

Per gross ton, f.o.b. cars:	
No. 1 hvy. melting	\$25.50 to \$26.00
No. 2 hvy. melting	21.50 to 22.00
No. 1 bundles	25.50 to 26.00
No. 2 bundles	17.50 to 18.00
Machine shop turn.	12.50 to 13.00
Mixed bor. and turn.	13.50 to 14.00
Shoveling turnings	15.50 to 16.00
Cast iron borings	15.50 to 16.00
Low phos. 18 in. under	32.00 to 32.50
Rails, random lengths	32.00 to 33.00
Rails, 18 in. and under	40.00 to 41.00
No. 1 cupola cast	35.00 to 36.00
Hvy. breakable cast	31.00 to 32.00
Drop broken cast	40.00 to 41.00

San Francisco

No. 1 hvy. melting	\$20.00
No. 2 hvy. melting	18.00
No. 1 bundles	16.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Machine shop turn	9.00
Elec. fur. 1 ft and under	28.00
No. 1 RR. hvy. melting	20.00
Scrap rails, random lgth.	20.00
No. 1 cupola cast	\$30.00 to 33.00

Los Angeles

No. 1 hvy. melting	\$20.00
No. 2 hvy. melting	18.00
No. 1 bundles	16.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Mach. shop turn.	12.00
Elec. fur. 1 ft and under	30.00
No. 1 RR. hvy. melting	20.00
No. 1 cupola cast	\$24.50 to 37.00

Seattle

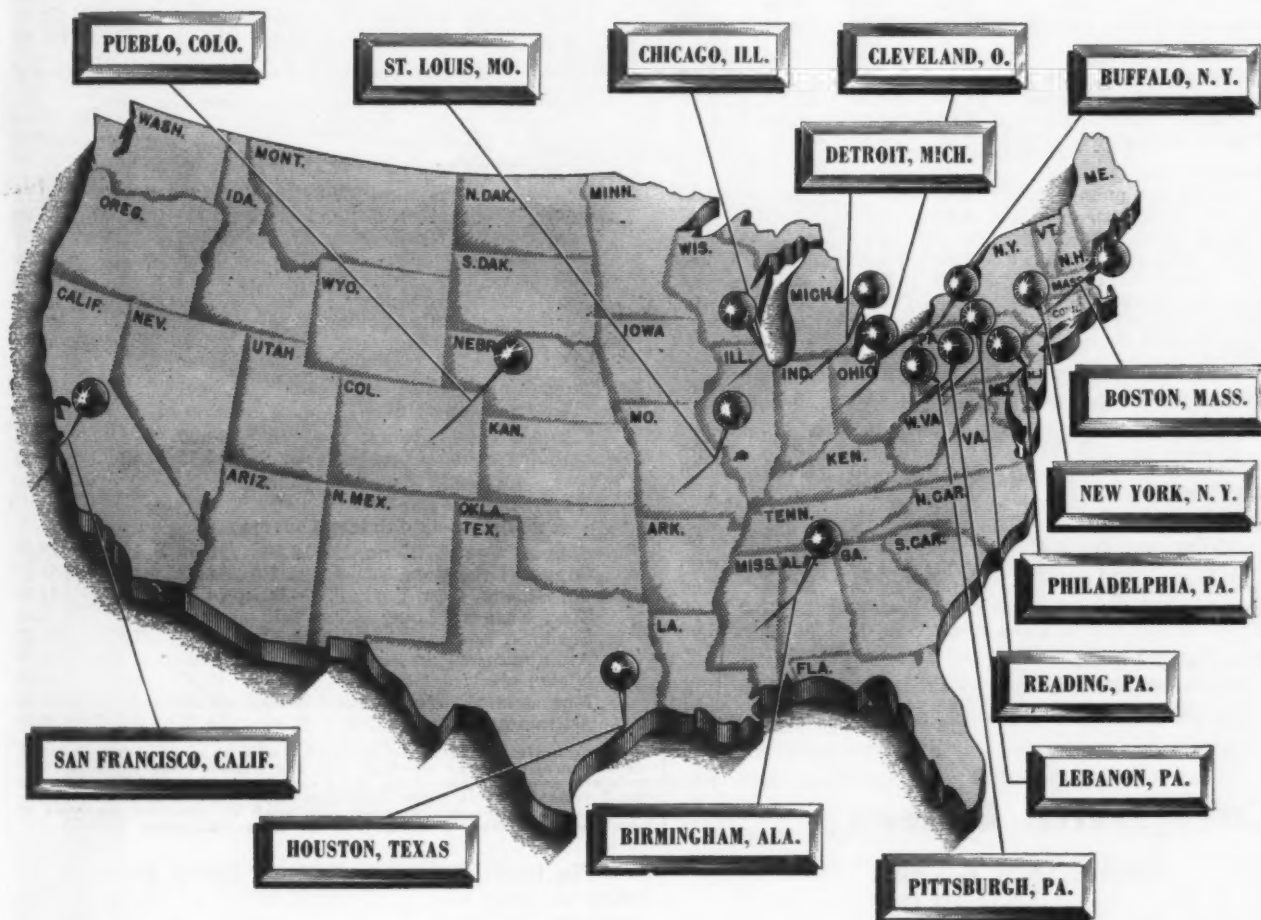
No. 1 hvy. melting	\$18.00
No. 2 hvy. melting	18.00
No. 1 bundles	16.00
No. 2 bundles	16.00
No. 3 bundles	12.00
Elec. fur. 1 ft. and under	\$25.00 to 28.00
RR. hvy. melting	19.00
No. 1 cupola cast	30.00
Heavy breakable cast.	20.00

Hamilton, Ont.

No. 1 hvy. melting	\$24.00
No. 1 bundles	16.00
No. 2 bundles	16.00
Mechanical bundles	22.00
Mixed steel scrap	20.00
Mixed bor. and turn.	18.00
Rails, remelting	24.00
Rails, rerolling	27.00
Bushellings	18.50
Bush., new fact, prep'd.	22.00
Bush., new fact, unprep'd	17.00
Short steel turnings	18.00
Cast scrap	\$40.00 to 43.00

For the Purchase or Sale of Iron and Steel Scrap...

CONSULT OUR NEAREST OFFICE



The energy and integrity of our organization is ready to serve your best interests ...
Since 1889, Luria Brothers & Company, Inc. have made fair dealings their constant aim.

CONSULT OUR NEAREST OFFICE FOR THE PURCHASE AND SALE OF SCRAP

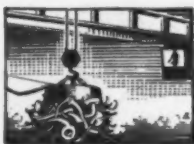
LURIA BROTHERS AND COMPANY, INC.

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

February 9, 1950

Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel:	Feb. 7, 1950	Jan. 31, 1950	Jan. 10 1950	Feb. 8, 1949
(cents per pound)				
Hot-rolled sheets	3.35	3.35	3.35	3.26
Cold-rolled sheets	4.10	4.10	4.10	4.00
Galvanized sheets (10 ga)	4.40	4.40	4.40	4.40
Hot-rolled strip	3.25	3.25	3.25	3.265
Cold-rolled strip	4.21	4.21	4.21	4.063
Plates	3.50	3.50	3.50	3.42
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	33.00	33.00	33.00	33.25

Tin and Terneplate:

(dollars per base box)				
Tinplate (1.50 lb) cokes	\$7.50	\$7.50	\$7.50	\$7.75
Tinplate, electro (0.50 lb)	6.60	6.60	6.60	6.70
Special coated mfg. ternes	6.50	6.50	6.50	6.65

Bars and Shapes:

(cents per pound)				
Merchant bars	3.45	3.45	3.45	3.37
Cold-finished bars	4.145*	4.145*	4.145*	3.995
Alloy bars	3.95	3.95	3.95	3.75
Structural shapes	3.40	3.40	3.40	3.25
Stainless bars (No. 302)	28.50	28.50	28.50	28.50
Wrought iron bars	9.50	9.50	9.50	9.50

Wire:

(cents per pound)				
Bright wire	4.50	4.50	4.50	4.256

Rails:

(dollars per 100 lb)				
Heavy rails	\$3.40	\$3.40	\$3.40	\$3.20
Light rails	3.75	3.75	3.75	3.55

Semifinished Steel:

(dollars per net ton)				
Rerolling billets	\$54.00	\$54.00	\$54.00	\$52.00
Slabs, rerolling	54.00	54.00	54.00	52.00
Forging billets	63.00	63.00	63.00	61.00
Alloy blooms, billets, slabs	66.00	66.00	66.00	63.00

Wire Rod and Skelp:

(cents per pound)				
Wire rods	3.85	3.85	3.85	3.619
Skelp	3.15	3.15	3.15	3.25

* Revised

Composite Prices

Finished Steel Base Price	
Feb. 7, 1950	3.837¢ per lb.
One week ago	3.837¢ per lb.
One month ago	3.837¢ per lb.
One year ago	3.720¢ per lb.

	High		Low
1950....	3.837¢ Jan. 3	3.837¢ Jan. 3	
1949....	3.837¢ Dec. 27	3.705¢ May 3	
1948....	3.721¢ July 27	3.193¢ Jan. 1	
1947....	3.193¢ July 29	2.848¢ Jan. 1	
1946....	2.848¢ Dec. 31	2.464¢ Jan. 1	
1945....	2.464¢ May 29	2.396¢ Jan. 1	
1944....	2.396¢	2.396¢	
1943....	2.396¢	2.396¢	
1942....	2.396¢	2.396¢	
1941....	2.396¢	2.396¢	
1940....	2.30467¢ Jan. 2	2.24107¢ Apr. 16	
1939....	2.35367¢ Jan. 3	2.26689¢ May 16	
1938....	2.58414¢ Jan. 4	2.27207¢ Oct. 18	
1937....	2.58414¢ Mar. 9	2.32263¢ Jan. 4	
1936....	2.32263¢ Dec. 28	2.05200¢ Mar. 10	
1935....	2.07642¢ Oct. 1	2.06492¢ Jan. 8	
1932....	1.89196¢ July 5	1.83901¢ Mar. 1	
1929....	2.31773¢ May 28	2.26498¢ Oct. 29	

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Prices advances over previous week are printed in Heavy Type; declines appear in *italics*.

Pig Iron:	Feb. 7, 1950	Jan. 31, 1950	Jan. 10 1950	Feb. 8, 1949
(per gross ton)				
No. 2, foundry, Phila....	\$50.42	\$50.42	\$50.42	\$51.56
No. 2, Valley furnace....	46.50	46.50	46.50	46.50
No. 2, Southern Cin'ti....	49.08	47.08	46.08	49.46
No. 2, Birmingham....	42.38	40.38	39.38	43.38
No. 2, foundry, Chicago†	46.50	46.50	46.50	46.50
Basic del'd Philadelphia.	49.92	49.92	49.92	50.76
Basic, Valley furnace....	46.00	46.00	46.00	46.00
Malleable, Chicago†	46.50	46.50	46.50	46.50
Malleable, Valley	46.50	46.50	46.50	46.50
Charcoal, Chicago	68.56	68.56	68.56	73.78
Ferromanganese†	173.40	173.40	173.40	161.40

†The switching charge for delivery to foundries in the Chicago district is \$1 per ton.

‡Average of U. S. prices quoted on Ferroalloy page.

Scrap:

(per gross tons)				
Heavy melt'g steel, P'gh.	\$31.25	\$30.75	\$29.75	\$38.75
Heavy melt'g steel, Phila.	23.00	23.00	23.00	39.50
Heavy melt'g steel, Ch'go	27.50	27.50	26.50	34.50
No. 1 hy. com. sh't, Det.	23.50	23.50	23.50	32.50
Low phos. Young'n....	31.75	31.75	31.75	45.25
No. 1, cast, Pittsburgh..	37.50	37.50	37.50	58.50
No. 1, cast, Philadelphia.	37.00	37.00	37.00	46.00
No. 1, cast, Chicago	38.50	38.50	38.50	49.00

Coke: Connellsville:

(per net ton at oven)				
Furnace coke, prompt...	\$14.00	\$14.00	\$14.00	\$15.25
Foundry coke, prompt...	15.75	15.75	15.75	16.75

Nonferrous Metals:

(cents per pound to large buyers)				
Copper, electro, Conn....	18.50	18.50	18.50	23.50
Copper, Lake Conn....	18.625	18.625	18.625	23.625
Tin Straits, New York...	74.50	74.50	77.00	\$1.03
Zinc, East St. Louis....	9.75	9.75	9.75	17.50
Lead, St. Louis.....	11.80	11.80	11.80	21.30
Aluminum, virgin	17.00	17.00	17.00	17.00
Nickel electrolytic	42.97	42.97	42.97	42.90
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex..	27.25	28.75	32.00	38.50

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1940 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)

Pig Iron

\$46.38	per gross ton....
46.05	per gross ton....
45.88	per gross ton....
46.74	per gross ton....

Scrap Steel

\$27.25	per gross ton....
27.08	per gross ton....
26.42	per gross ton....
37.58	per gross ton....

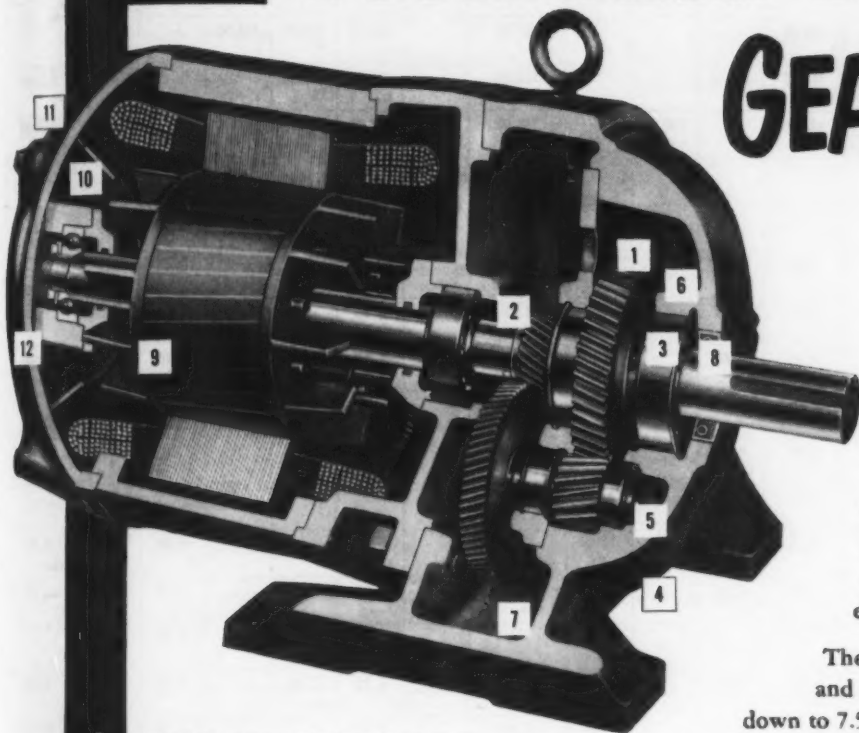
	High		Low
\$46.38	Feb. 7	\$45.88	Jan. 3
46.87	Jan. 18	45.88	Sept. 6
46.91	Oct. 12	39.58	Jan. 6
37.98	Dec. 30	30.14	Jan. 7
30.14	Dec. 10	25.37	Jan. 1
25.37	Oct. 23	23.61	Jan. 2
		\$23.61	
		23.61	
		23.61	
\$23.61	Mar. 20	\$23.45	Jan. 2
23.45	Dec. 23	22.61	Jan. 2
22.61	Sept. 19	20.61	Sept. 12
23.25	June 21	19.61	July 6
23.25	Mar. 9	20.25	Feb. 16
19.74	Nov. 24	18.73	Aug. 11
18.84	Nov. 5	17.83	May 14
14.81	Jan. 5	13.56	Dec. 6
18.71	May 14	18.21	Dec. 17

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

for **BETTER** power transmission

FOOTE BROS.-LOUIS ALLIS GEARMOTORS



1 h. p. double reduction unit
with output speeds from 230
R. P. M. to 45 R. P. M.

The new line of Foote Bros.-Louis Allis Gearmotors offers industry new compactness in design — improved efficiency in operation — longer life.

These units are available in single, double and triple reductions, output speeds of 780 down to 7.5 R. P. M., in ratings of 1 h. p. through 75 h. p. Open drip-proof, splash-proof, enclosed and explosion-proof motors are available.

These drives are compact in design with sturdy cast housings, streamlined inside and out. Precision helical gears have file-hard tooth surfaces and tough, resilient cores, giving long-wear life and maximum load carrying capacity. Mail the coupon for bulletin.

FOOTE BROS. GEAR AND MACHINE CORPORATION
Dept. M, 4545 South Western Boulevard • Chicago 9, Illinois

- 1 Precision Gears—File Hard Tooth Surfaces—Resilient Cores
- 2 Tang Driven Motor Shaft Pinion provides positive locking without small keyways
- 3 Extra Capacity Ball or Tapered Roller Bearings
- 4 Cast Iron Construction for maximum rigidity under load
- 5 Corner Mounted Offset Shaft—More Compact Design
- 6 Unit Case with Integral Bearing Housings Maintains Gear Alignment
- 7 Large Oil Reservoir—Efficient Splash Lubrication
- 8 Leakproof Oil Seals
- 9 Dynamically Balanced, Die Cast Aluminum Rotor
- 10 Impregnated Windings Protect from Moisture, Weak Acids, Alkali, Dust and Oil
- 11 Cast Iron Housing, Head and Flange Insure Strength and Rigidity
- 12 Ball Bearing Motor for Trouble-free Operation



FOOTE BROS.

Better Power Transmission Through Better Gears

Foote Bros. Gear and Machine Corporation Dept. M
4545 S. Western Blvd., Chicago 9, Illinois

Gentlemen: Please send me a copy of Bulletin AGM with Information on Foote Bros.-Louis Allis Gearmotor.

Name.....

Company.....

Address.....

City.....State.....



Single Reduction

Double Reduction

Triple Reduction

IRON AGE

**STEEL
PRICES**

Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page.
Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply

	Pittsburgh	Chicago	Gary	Cleveland	Canton Massillon	Middle- town	Youngs- town	Bethle- hem	Buffalo	Consho- hocken	Johns- town	Spar- rows Point	Granite City	Detroit
INGOTS														
Carbon forging, net ton	\$50.00 1													\$50.00 81
Alloy net ton	\$51.00 1.17													\$51.00 81
BILLETS, BLOOMS, SLABS														
Carbon, re-rolling, net ton	\$53.00 1	\$53.00 1	\$53.00 1				\$57.00 12		\$63.00 3	\$58.00 26	\$53.00 3			
Carbon forging billets, net ton	\$63.00 1	\$63.00 1.4	\$63.00 1.8	\$63.00 4			\$63.00 25		\$63.00 3.4	\$65.00 26	\$63.00 3			\$63.00 81
Alloy, net ton	\$66.00 1.17	\$66.00 1.4	\$66.00 1		\$66.00 4.42		\$66.00 13	\$66.00 3	\$66.00 3.4	\$66.00 26	\$66.00 3			\$66.00 81
SHEET BARS							\$57.00 13							
PIPE SKELP	3.15 1.5						3.15 1.4							
WIRE RODS	3.85 2.18	3.85 2.4.38	3.85 6	3.85 2			3.85 6				3.85 3	3.93 3		
SHEETS														
Hot-rolled (18 ga. & hvr.)	3.35 1.5.9.15	3.35 23	3.35 1.6.8	3.35 4.6			3.35 1.4.6.13		3.35 3	3.45 26		3.35 3		3.55 12
Cold-rolled	4.10 ¹⁻⁸ 7.9.10.62		4.10 1.6.8	4.10 4.15		4.10 7	4.10 4.6		4.10 3			4.10 3	4.30 23	4.30 12
Galvanized (10 gage)	4.40 1.8.15		4.40 1.8		4.40 4		4.65 ^{5.4} 4.75 ^{4.4}					4.40 3		
Enameling (12 gage)	4.40 1		4.40 1.8	4.40 4		4.40 7	4.40 ⁶ 4.90 ^{7.6}						4.60 22	4.70 12
Long term (10 gage)	4.80 9.15		4.80 1			4.80 7	4.80 84							
Hi Str. low alloy, h.r.	5.05 1.5.9	5.05 1	5.05 1.6.8	5.05 4.5			5.05 1.4.6.13		5.05 3	5.05 26		5.05 3		5.25 12
Hi Str. low alloy, c.r.	6.20 1.5.9		6.20 1.6.8	6.20 4.5			6.20 1.4.6.13		6.20 3			6.20 3		6.40 12
Hi Str. low alloy, galv.	6.75 1											6.75 3		
STRIP														
Hot-rolled (over 6 in.)	3.25 5.7.9.28	3.25 3.66	3.25 1.6.8	3.25 5			3.25 1.4.6.13		3.25 3	3.35 26		3.25 3		3.45 12.47
Cold-rolled	4.15 5.7.9.63	4.30 8.66	4.30 8	4.15 2.5		4.15 7	4.15 4.6.13.40.48.49		4.15 3			4.15 3		4.40 ^{8.4} 4.35 ^{13.47}
Hi Str. low alloy, h.r.	4.95 9		4.95 1.6.8	4.95 5			4.95 1.4.6.13		4.95 3	4.95 26		4.95 3		5.15 12
Hi Str. low alloy, c.r.	6.20 9			6.20 2.5			6.20 4.6.13		6.20 3			6.20 3		6.40 12
TINPLATE†														
Cokes, 1.50-lb. base box 1.25 lb. deduct 20¢	\$7.50 1.5.9.15		\$7.50 1.6.8				\$7.50 4					\$7.60 3	\$7.70 22	
Electrolytic 0.25, 0.50, 0.75 lb box	Deduct \$1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price													
BLACKPLATE, 29 gage Hollowware enameling	5.30 1.5.15		5.30 1.6				5.30 4					5.40 3	5.50 23	
BAR														
Carbon steel	3.45 1.5.9.17	3.45 1.4.28	3.45 1.6.8	3.45 4	3.45 4		3.45 1.4.6		3.45 3.4		3.45 3			3.65 12
Reinforcing‡	3.45 1.5	3.45 4	3.45 1.6.8	3.45 4			3.45 1.4.6		3.45 3.4		3.45 3	3.45 3		
Cold-finished	4.10 ⁵ 4.15 ²⁻⁴ 17.32.69.71	4.15 ² 23.69.70	4.15 4.73.74	4.15 2.61	4.15 4.82.82		4.15 6.40.57		4.15 70					4.45 12
Alloy, hot-rolled	3.95 1.17	3.95 1.4.28	3.95 1.6.8		3.95 4		3.95 1.6.25	3.95 3	3.95 3.4		3.95 3			4.25 12
Alloy, cold-drawn	4.90 2x17.32.69.71	4.90 2x23.69.70	4.90 4.73.74	4.90 2.61	4.90 4.82.82		4.90 6.25.57	4.90 3	4.90 3.70					
Hi Str. low alloy, h.r.	5.20 1.5		5.20 1.6.8	5.20 4			5.20 1.6	5.20 3	5.20 3		5.20 3			5.40 12
PLATE														
Carbon Steel	3.50 1.5	3.50 1	3.50 1.6.8	3.50 4			3.50 1.13		3.50 3	3.60 26	3.50 3	3.50 3		3.75 19
Floor plates	4.55 1	4.55 1	4.55 3	4.55 5						4.55 26				
Alloy	4.40 1	4.40 1	4.40 1				4.40 18			4.40 26	4.40 3	4.40 3		
Hi Str. low alloy	5.35 1.5	5.35 1	5.35 1.8	5.35 4.5			5.35 6			5.35 26	5.35 3	5.35 3		5.60 12
SHAPES, Structural														
Hi Str. low alloy	3.40 1.5.9	3.40 1.23	3.40 1.6.8					3.45 3	3.45 3		3.45 3			
Hi Str. low alloy	5.15 1.5	5.15 1	5.15 1.6.8				5.15 6	5.15 3	5.15 3		5.15 3			
MANUFACTURERS' WIRE Bright	4.50 2.5.18	4.50 ² 4.19.33.34		4.50 2.77			4.50 6	Kokomo = 4.60 ³⁰			4.50 3	4.60 3		Duluth = 4.50 ² Pueblo = 4.75 ^{1.4}
PILING, Steel sheet	4.20 ^{1.9} 1	4.20 1							4.20 3					

Smaller numbers indicate producing companies. See key at right.
Prices are in cents per lb unless otherwise noted. Extras apply.

IRON AGE

STEEL PRICES

Kansas City	Houston	Birmingham	WEST COAST Seattle, San Francisco, Los Angeles, Fontana	
	\$59.00 88			INGOTS Carbon forging, net ton
		\$53.00 11	F = \$72.00 ¹⁹	Alloy, net ton
	\$71.00 88	\$63.00 11	F = \$82.00 ¹⁹	BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton
	\$74.00 88		F = \$82.00 ¹⁹	Carbon forging billets, net ton
			Geneva = \$81.00 ¹⁴	Alloy net ton
			Portsmouth = \$55.00 ²⁰	SHEET BARS
				PIPE SKELP
4.25 88	3.85 11	SF = 4.50 ²⁴ , LA = 4.85 ²⁴ LA = 4.20 ²³	Portsmouth = 3.85 ²⁰ Worcester = 4.15 ²	WIRE RODS
	3.35 4.11	SF, LA = 4.05 ²⁴ F = 4.25 ¹⁹	Ashland ⁷ = 3.35 Niles = 3.50 ⁶⁴	SHEETS Hot-rolled (16 ga. & hvr.)
	4.10 11	SF = 5.05 ²⁴ F = 5.00 ¹⁹		Cold-rolled
	4.40 4.11	SF, LA = 5.15 ²⁴	Ashland = 4.40 ⁷ Kokomo = 4.50 ²⁰	Galvanized (10 gage)
				Enameling (12 gage)
				Long ternes (10 gage)
	5.05 11	F = 6.74 ¹⁹		Hi Str. low alloy, h.r.
		F = 7.05 ¹⁹		Hi Str. low alloy, c.r.
				Hi Str. low alloy, galv.
3.85 88	3.65 88	3.25 11	SF, LA = 4.00 ²⁴ , 62 F = 4.40 ¹⁹ , S = 4.25 ²²	STRIP Hot-rolled
			F = 5.40 ¹⁹ LA = 5.50 ²⁷	Cold-rolled
		4.95 11	F = 6.64 ¹⁹	Hi Str. low alloy, h.r.
			F = 6.95 ¹⁹	Hi Str. low alloy c.r.
				TINPLATE Cokes, 1.50-lb base box 1.25 lb, deduct 20¢
				Electrolytic 0.25, 0.50, 0.75 lb box
				BLACKPLATE, 29 gage Hollowware enameling
4.05 88	3.85 88	3.45 4.11	SF, LA = 4.15 ²⁴ LA = 4.15 ²²	BARS Carbon steel
4.05 88	3.85 88	3.45 4.11	SF, S = 4.20 ²² F = 4.10 ¹⁹	Reinforcing†
			Putnam, Newark = 4.55 ⁶⁹	Cold-finished
4.85 88	4.35 88		LA = 5.00 ²² F = 4.95 ¹⁹	Alloy, hot-rolled
			Newark, ⁶⁹ Worcester ² = 5.20 Hartford = 5.20 ⁴	Alloy, cold-drawn
		5.20	F = 6.25 ¹⁹	Hi Str. low alloy, h.r.
	3.90 88	3.50 4.11	F = 4.10 ¹⁹ S = 4.40 ²² Geneva = 3.50 ¹⁶	PLATE Carbon steel
			Harrisburg = 4.55 ²⁵	Floor plates
			F = 5.43 ¹⁹	Alloy
		5.35 11	F = 5.95 ¹⁹	Hi Str. low alloy
4.00 88	3.80 88	3.40 11	SF = 3.95 ²² LA = 4.00 ²⁴ , 63	SHAPES, Structural
		5.15 11	F = 4.00 ¹⁹ S = 4.05 ²²	Hi Str. low alloy
5.10 88	4.90 88	4.50 4.11	SF, LA = 5.45 ²⁴ LA = 5.10 ²³	MANUFACTURERS' WIRE Bright
			Portsmouth = 4.50 ²⁰ Worcester = 4.80 ²	

KEY TO STEEL PRODUCERS

With Principal Offices

- Carnegie-Illinois Steel Corp., Pittsburgh
- American Steel & Wire Co., Cleveland
- Bethlehem Steel Co., Bethlehem
- Republic Steel Corp., Cleveland
- Jones & Laughlin Steel Corp., Pittsburgh
- Youngstown Sheet & Tube Co., Youngstown
- Armco Steel Corp., Middletown, Ohio
- Inland Steel Co., Chicago
- Weirton Steel Co., Weirton, W. Va.
- National Tube Co., Pittsburgh
- Tennessee Coal, Iron & R. R. Co., Birmingham
- Great Lakes Steel Corp., Detroit
- Sharon Steel Corp., Sharon, Pa.
- Colorado Fuel & Iron Corp., Denver
- Wheeling Steel Corp., Wheeling, W. Va.
- Geneva Steel Co., Salt Lake City
- Crucible Steel Co. of America, New York
- Pittsburgh Steel Co., Pittsburgh
- Kaiser Co., Inc., Oakland, Calif.
- Portsmouth Steel Corp., Portsmouth, Ohio
- Lukens Steel Co., Coatesville, Pa.
- Granite City Steel Co., Granite City, Ill.
- Wisconsin Steel Co., South Chicago, Ill.
- Columbia Steel Co., San Francisco
- Copperweld Steel Co., Glassport, Pa.
- Alan Wood Steel Co., Conshohocken, Pa.
- Calif. Cold Rolled Steel Corp., Los Angeles
- Allegheny Ludlum Steel Corp., Pittsburgh
- Worth Steel Co., Claymont, Del.
- Continental Steel Corp., Kokomo, Ind.
- Rotary Electric Steel Co., Detroit
- Laclede Steel Co., St. Louis
- Northwestern Steel & Wire Co., Sterling, Ill.
- Keystone Steel & Wire Co., Peoria, Ill.
- Central Iron & Steel Co., Harrisburg, Pa.
- Carpenter Steel Co., Reading, Pa.
- Eastern Stainless Steel Corp., Baltimore
- Washington Steel Corp., Washington, Pa.
- Jessop Steel Co., Washington, Pa.
- Blair Strip Steel Co., New Castle, Pa.
- Superior Steel Corp., Carnegie, Pa.
- Timken Steel & Tube Div., Canton, Ohio
- Babcock & Wilcox Tube Co., Beaver Falls, Pa.
- Reeves Steel & Mfg. Co., Dover, Ohio
- John A. Roebling's Sons Co., Trenton, N. J.
- Simonds Saw & Steel Co., Fitchburg, Mass.
- McLouth Steel Corp., Detroit
- Cold Metal Products Co., Youngstown
- Thomas Steel Co., Warren, Ohio
- Wilson Steel & Wire Co., Chicago
- Sweet's Steel Co., Williamsport, Pa.
- Superior Drawn Steel Co., Monaca, Pa.
- Tremont Nail Co., Wareham, Mass.
- Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
- Ingersoll Steel Div., Chicago
- Phoenix Iron & Steel Co., Phoenixville, Pa.
- Fitzsimmons Steel Co., Youngstown
- Stanley Works, New Britain, Conn.
- Universal-Cyclops Steel Corp., Bridgeville, Pa.
- American Cladmetals Co., Carnegie, Pa.
- Cuyahoga Steel & Wire Co., Cleveland
- Bethlehem Pacific Coast Steel Corp., San Francisco
- Follansbee Steel Corp., Pittsburgh
- Niles Rolling Mill Co., Niles, Ohio
- Atlantic Steel Co., Atlanta
- Acme Steel Co., Chicago
- Joslyn Mfg. & Supply Co., Chicago
- Detroit Steel Corp., Detroit
- Wyckoff Steel Co., Pittsburgh
- Bliss & Laughlin, Inc., Harvey, Ill.
- Columbia Steel & Shifting Co., Pittsburgh
- Cumberland Steel Co., Cumberland, Md.
- La Salle Steel Co., Chicago
- Monarch Steel Co., Inc., Indianapolis
- Empire Steel Co., Mansfield, Ohio
- Mahoning Valley Steel Co., Niles, Ohio
- Oliver Iron & Steel Co., Pittsburgh
- Pittsburgh Screw & Bolt Co., Pittsburgh
- Standard Forgings Corp., Chicago
- Driver Harris Co., Harrison, N. J.
- Detroit Tube & Steel Div., Detroit
- Reliance Div., Eaton Mfg. Co., Massillon, Ohio
- Sheffield Steel Corp., Kansas City

Notes: †Special coated mfg ternes, deduct \$1.00 from 1.50-lb coke base box price.
Can-making quality blackplate, 65 to 128-lb, deduct \$1.90 from 1.50-lb coke base box.
†Straight lengths only from producer to fabricator.

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. mill

	Base Column Pittsburg, Calif.
Standard & coated nails*	106 125
Woven wire fence	116 139
Fence posts, carloads†	112
Single loop bale ties	113 137
Galvanized barbed wire**	126 146
Twisted barbed wire	126 146

* Pgh., Chi., Duluth; Worcester, 6 columns higher; Houston, 8 columns higher; Kansas City, 12 columns higher. † 15 1/2 gage and heavier. ** On 80 rod spools, in carloads. †† Duluth, Joliet and Johnstown.

	Base per 100 lb	Pittsburg, Calif.
Merch. wire, annealed†	\$5.35	\$6.30
Merch. wire, galv.†	5.60	6.55
Cut nails, carloads††	6.75	...

† Add 30¢ at Worcester; 20¢ at Chicago; 10¢ at Sparrows Pt.
†† Less 20¢ to jobbers.
‡ Torrance, 12¢.

PRODUCING POINTS—Standard, Coated or galvanized nails, woven wire fence, bale ties, and barbed wire: Alabama City, Ala., 4; Atlanta, 65; Alliquippa, Pa. (except bale ties), 5; Bartonville, Ill. (except bale ties), 34; Chicago, 4; Donora, Pa., 2; Duluth, 2; Fairfield, Ala., 11; Johnstown, Pa. (except bale ties), 3; Joliet, Ill., 2; Kokomo, Ind., 30; Minnequa, Colo., 14; Monessen, Pa. (except bale ties), 18; Pittsburg, Calif., 24; Portsmouth, Ohio, 20; Rankin, Pa. (except bale ties), 2; Sparrows Point (except woven fence), 3; Sterling, Ill., 33; San Francisco (except nails and woven fence), 14; Torrance, Calif. (nails only), 24; Worcester (nails only), 2; Houston (except bale ties), 83; Kansas City, 83.

Fence posts: Duluth, 2; Johnstown, Pa., 3; Joliet, Ill., 2; Minnequa, Colo., 14; Moline, Ill., 4; Williamsport, Pa., 51.

Cut nails: Wheeling, W. Va., 15; Conshohocken, Pa., 26; Warehame, Mass., 53.

CLAD STEEL

Base prices, cents per pound, f.o.b. mill

	Plate	Sheet
Stainless-carbon		
No. 304, 20 pct.		
Coatesville, Pa. (21)	*26.50	
Washgtn, Pa. (39)	*26.50	
Claymont, Del. (29)	*26.50	
Conshohocken, Pa. (26)	*22.50	
New Castle, Ind. (55)	*26.50	*24.00
Nickel-carbon		
10 pct, Coatesville (26)	27.50	
Inconel-carbon		
10 pct, Coatesville (21)	36.00	
Monel-carbon		
10 pct, Coatesville (21)	29.00	
No. 302 Stainless-copper-stainless, Carnegie, Pa. (60)	75.00	
Aluminized steel sheets, hot dip, Butler, Pa. (7)	7.75	

* Includes annealing and pickling, or sandblasting.

ELECTRICAL SHEETS

22 gage, HR cut lengths, f.o.b. mill

	Cents per lb
Armature	+6.45
Electrical	+*6.95
Motor	*7.95
Dynamo	8.75
Transformer 72	9.30
Transformer 65	9.85
Transformer 58	10.55
Transformer 52	11.35

PRODUCING POINTS—Beech bottom, W. Va., 18; Brackenridge, Pa., 28; Follansbee, W. Va., 63; Granite City, Ill., 22*, add 20¢; Indiana Harbor, Ind., 8*, deduct 25¢; Mansfield, Ohio, 75; Niles, Ohio, 64, 76; Vandergrift, Pa., 1; Warren, Ohio, 4; Zanesville, Ohio, 7†, deduct 25¢.



Numbers after producing points correspond to steel producers. See key on Steel Price page.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)
Base discount

Machine and Carriage Bolts

	Pct Off List	Less Case C.
1/2 in. & smaller x 6 in. & shorter	27	38
9/16 & 5/8 in. x 6 in. & shorter	29	40
3/4 in. & larger x 6 in. & shorter	26	37
All diam., longer than 6 in.	22	34
Lag, all diam over 6 in. & longer	28	39
Lag, all diam x 6 in. & shorter	30	41
Plow bolts	40	—

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

1/2 in. and smaller	25	37
9/16 and 5/8 in.	23	35
3/4 to 1 1/2 in. inclusive	23	35
1 1/2 in. and larger	16	29

Semifinished Hexagon Nuts

(Less case lots)

	Pct Off List	Reg	Hvy	Lt
1/2 in. and smaller	41	35	41	41
9/16 & 5/8 in.	36	30	36	36
3/4 to 1 1/2 in.	31	27	33	33
1 1/2 in. and larger	21	17	—	—

In full case lots, 15 pct additional discount.

Stove Bolts

	Pct Off List
Packaged, steel, plain finish	63 1/2 and 10
Packaged, plated finish	50 and 10
Bulk, plain finish**	72*

* Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5,000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

** Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Large Rivets

(1/2 in. and larger)

	Base per 100 lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa.	\$7.25

Small Rivets

(7/16 in. and smaller)

	Pct Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	43

Cap and Set Screws

	Pct Off List
(In bulk)	
Hexagon head cap screws, coarse or fine thread, 1/4 in. thru 3/4 in. x 6 in., SAE 1020, bright	60
1/4 in. through 3/4 in. x 6 in. and shorter (SAE 1035) heat treated	54
Milled studs	28
Flat head cap screws, listed sizes	24
Fillister head cap, listed sizes	43

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon	4.15¢
0.41 to 0.60 carbon	5.95¢
0.61 to 0.80 carbon	6.55¢
0.81 to 1.05 carbon	8.50¢
1.06 to 1.35 carbon	10.80¢

Worcester, add 0.30¢.

LAKE SUPERIOR ORES

(51.50% Fe; natural content, delivered lower lake ports)

	Per gross ton
Old range, bessemer	\$8.10
Old range, nonbessemer	7.95
Mesabi, bessemer	7.85
Mesabi, nonbessemer	7.70
High phosphorus	7.70

After Dec. 31, 1948, increases or decreases in Upper Lake freight, dock and handling charges and taxes thereon to be for the buyers' account.

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 quality, per 100 lb	\$3.40
Joint bars, per 100 lb	4.40
Light rails, per 100 lb	3.75
Base Price cents per lb	
Track spikes†	5.60
Axles	6.25
Screw spikes	8.60
Tie plates	4.20
Tie plates, Pittsburgh, Torr., Calif.*	4.35
Track bolts, untreated	8.85
Track bolts, heat treated, to railroads	9.10

* Seattle, add 30¢.
† Kansas City, 5.85¢.

PRODUCING POINTS—Standard rails: Bessemer, Pa., 1; Ensley, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Minnequa, Colo., 14; Steelton, Pa., 3.

Light rails: All the above except Indiana Harbor and Steelton, plus Fairfield, Ala., 11; Johnstown, Pa., 3; Minnequa, Colo., 14.

Joint bars: Bessemer, Pa., 1; Fairfield, Ala., 11; Indiana Harbor, Ind., 8; Joliet, Ill., 1; Lackawanna, N. Y., 3; Steelton, Pa., 3; Minnequa, Colo., 14.

Track spikes: Fairfield, Ala., 11; Indiana Harbor, Ind., 6, 8; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 6; Chicago, 4; Struthers, Ohio, 6; Youngstown, 4.

Track bolts: Fairfield, Ala., 11; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 77, 78.

Axles: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 79; Johnstown, Pa., 3; McKees Rocks, Pa., 1.

Tie plates: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Pittsburgh, Calif., 24; Pittsburgh, 4; Seattle, 62; Steelton, Pa., 3; Torrance, Calif., 24; Minnequa, Colo., 14.

TOOL STEEL

F.o.b. mill

	W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	—	\$1.00
18	4	1	—	—	5	\$1.565
18	4	2	—	—	—	\$1.13
1.5	4	1.5	8	—	—	71.5¢
6	4	2	6	—	—	76.5¢

High-carbon-chromium	57.5¢
Oil hardened manganese	32¢
Special carbon	29.5¢
Extra carbon	24.5¢
Regular carbon	21¢

Warehouse prices on and east of Mississippi are 2 1/2¢ per lb higher. West of Mississippi, 4 1/2¢ higher.

COKE

	Net Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	\$13.50 to \$14.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	\$15.50 to \$16.00
Foundry, oven coke	
Buffalo, del'd	\$20.90
Chicago, f.o.b.	21.00
Detroit, f.o.b.	19.40
New England, del'd	22.70
Seaboard, N. J., f.o.b.	22.00
Philadelphia, f.o.b.	20.45
Swedeland, Pa., f.o.b.	20.40
Painesville, Ohio, f.o.b.	21.90
Erie, del'd	\$21.04 to 21.25
Cleveland, del'd	22.62
Cincinnati, del'd	22.71
St. Paul, f.o.b.	23.50
St. Louis, del'd	21.60
Birmingham, del'd	19.75

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill. Base price, per ton net: Effective CaF₂ content:

70% or more	\$37.00
60% or less	34.00

STAINLESS STEELS

Base prices, in cents per pound.
f.o.b. producing point

Product	301	302	303	304	316	321	347	410	418	430
Ingot, rerolling	12.75	13.50	15.00	14.50	22.75	18.25	20.00	11.25	13.75	11.50
Slabs, billets, rerolling	17.00	18.25	20.25	19.25	30.25	24.50	26.75	15.00	18.50	15.25
Forg. discs, die blocks, rings	30.50	30.50	33.00	32.00	46.00	38.50	41.00	24.50	25.00	25.00
Billets, forging	24.25	24.25	26.25	25.50	39.00	29.00	32.75	19.50	20.00	20.00
Bars, wire, structural	28.50	28.50	31.00	30.00	46.00	34.00	36.50	23.00	23.50	23.50
Plates	32.00	32.00	34.00	34.00	50.50	39.50	44.00	26.00	26.50	26.50
Sheets	37.50	37.50	39.50	39.50	53.00	45.50	50.00	33.00	33.50	33.50
Strip, hot-rolled	24.25	25.75	30.00	27.75	46.00	34.50	36.75	21.25	26.00	21.75
Strip cold-rolled	30.50	33.00	36.50	35.00	55.00	44.50	48.50	27.00	33.50	27.50

Numbers correspond to producers. See Key on Steel Price Page.

STAINLESS STEEL PRODUCING POINTS—Sheets: Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38, 39; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Lockport, N. Y., 46.

Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38; W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 49; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, 13; Butler, Pa., 7.

Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1, 67; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42.

Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Chicago, 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28.

Structurals: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44.

Plates: Brackenridge, Pa., 28; Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

Forged discs, die blocks, rings: Pittsburgh, 1, 17; Syracuse, 17; Ferndale, Mich., 28.

Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1.

PIPE AND TUBING

Base discounts, f.o.b. mills
Base price, about \$200.00 per net ton

Standard, T & C

Steel, butt weld*	Black	Galv
1/2-in.	40 1/2 to 38 1/2	24 to 22
3/4-in.	43 1/2 to 41 1/2	28 to 26
1-in.	46 to 44	31 to 29
1 1/4-in.	46 1/2 to 44 1/2	31 1/2 to 29 1/2
1 1/2-in.	47 to 45	32 to 30
2-in.	47 1/2 to 45 1/2	32 1/2 to 30 1/2
2 1/2 to 3-in.	48 to 46	33 to 31

Steel, lap weld		
2-in.	37	23 1/2 to 21 1/2
2 1/2 to 3-in.	41	25 1/2 to 24 1/2
3 1/2 to 6-in.	44 to 40	28 1/2 to 24 1/2

Steel, seamless		
2-in.	36	20 1/2
2 1/2 to 3-in.	39	23 1/2
3 1/2 to 6-in.	41	25 1/2

Wrought iron, butt weld		
1/2-in.	+26 1/2	+53
3/4-in.	+16 1/2	+42
1 & 1 1/4-in.	+10 1/2	+33
1 1/2-in.	+4 1/2	+29 1/2
2-in.	+4	+29

Wrought iron, lap weld		
2-in.	+13 1/2	+37
2 1/2 to 3 1/2-in.	+11	+32 1/2
4-in.	+6	+26 1/2
4 1/2 to 8-in.	+8	+28
9 to 12-in.	+18	+37 1/2

Extra Strong, Plain Ends

Steel, butt weld		
1/2-in.	39 1/2 to 37 1/2	24 1/2 to 22 1/2
3/4-in.	43 1/2 to 41 1/2	28 1/2 to 26 1/2
1-in.	45 1/2 to 43 1/2	31 1/2 to 29 1/2
1 1/4-in.	46 to 44	32 to 30
1 1/2-in.	46 1/2 to 44 1/2	32 1/2 to 30 1/2
2-in.	47 to 45	33 to 32
2 1/2 to 3-in.	47 1/2 to 45 1/2	33 1/2 to 31 1/2

Steel, lap weld		
2-in.	37 to 36	22 1/2 to 21 1/2
2 1/2 to 3-in.	42 to 40	27 1/2 to 25 1/2
3 1/2 to 6-in.	45 1/2 to 41 1/2	31 to 29

Steel, seamless		
2-in.	35	20 1/2
2 1/2 to 3-in.	39	24 1/2
3 1/2 to 6-in.	42 1/2	28

Wrought iron, butt weld		
1/2-in.	+22	+47
3/4-in.	+15 1/2	+40
1 to 2-in.	+5 1/2	+29

Wrought iron, lap weld		
2-in.	+10 1/2	+33 1/2
2 1/2 to 4-in.	+1	+22
4 1/2 to 6-in.	+5	+26 1/2
7 & 8-in.	flat	+21 1/2
9 to 12-in.	+11 1/2	+29 1/2

For threads only, butt weld, lap weld and seamless pipe, one point higher discount (lower price) applies. For plain ends, butt weld, lap weld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lap weld and seamless 3 1/2-in. and larger four points higher discount (lower price) applies. On butt weld and lap weld steel pipe, jobbers are granted a discount of 5 pct. *Fontana, Calif. deduct 11 points from figures in left columns.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut lengths 10 to 24 ft inclusive.

OD in in.	gage BWG	Seamless H.R.	Electric H.R.	Weld C.D.	
2	13	\$20.61	\$24.24	\$19.99	\$23.51
2 1/2	12	27.71	32.58	26.88	31.60
3	12	30.82	36.27	29.90	35.18
3 1/2	11	38.52	45.38	37.36	43.99
4	10	47.82	56.25	46.39	54.56

CAST IRON WATER PIPE

	Per net ton
6 to 24-in., del'd Chicago	\$91.80 to \$95.30
6 to 24-in., del'd N. Y.	91.00 to 92.00
6 to 24-in., Birmingham	78.00 to 82.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less	\$108.50 to \$113.00
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.	

REFRACTORIES (F.o.b. works)

Fire Clay Brick	Carloads, Per 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5)	\$86.00
No. 1 Ohio	80.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	80.00
No. 2 Ohio	72.00
Ground fire clay, net ton bulk (except Salina, Pa., add \$1.50)	14.00

Silica Brick	
Mt. Union, Pa., Ensley, Ala.	\$86.00
Childs, Pa.	90.00
Hays, Pa.	91.00
Chicago District	95.00
Western, Utah and Calif.	101.00
Super Duty, Hays, Pa., Athens, Tex., Chicago	106.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	15.00
Silica cement, net ton, bulk, Hays, Pa.	17.00
Silica cement, net ton, bulk, Ensley, Ala.	16.00
Silica cement, net ton, bulk, Chicago District	16.00
Silica cement, net ton, bulk, Utah and Calif.	22.50

Chrome Brick	Per Net Ton
Standard chemically bonded, Balt., Chester	\$69.00

Magnesite Brick	
Standard, Baltimore	\$91.00
Chemically bonded, Baltimore	80.00

Grain Magnesite	Std. %-in. grains
Domestic, f.o.b. Baltimore, in bulk, fines removed	\$56.00 to \$56.50
Domestic, f.o.b. Chewelah, Wash., in bulk with fines	30.50 to 31.00
In sacks with fines	35.00 to 35.50

Dead Burned Dolomite	
F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk, Midwest, add 10¢; Missouri Valley, add 20¢	\$12.25

METAL POWDERS

	Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.
Swedish sponge iron c.l.f.	
New York, ocean bags	7.4¢ to 9.0¢

Domestic sponge iron, 98+%	
Fe, carload lots	9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+%	31.5¢ to 39.5¢
Electrolytic iron unannealed, minus 325 mesh, 99+%	48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+%	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 microns, 98%, 99.8+%	90.0¢ to \$1.75
Aluminum	29.00¢
Antimony	42.53¢
Brass, 10 ton lots	23.25¢ to 26.75¢
Copper, electrolytic	28.625¢
Copper, reduced	28.50¢
Cadmium	\$2.40
Chromium, electrolytic, 99% min.	\$3.50
Lead	18.50¢
Manganese	55.00¢
Molybdenum, 99%	\$2.65
Nickel, unannealed	61.00¢
Nickel, spherical, minus 30 mesh, unannealed	68.00¢
Silicon	34.00¢
Solder powder	8.5¢ plus metal cost
Stainless steel, 302	75.00¢
Tin	86.50¢
Tungsten, 99%	\$2.90
Zinc, 10 ton lots	15.50¢ to 18.25¢

ELECTRODES

Cents per lb, f.o.b. plant, threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb
GRAPHITE		
17, 18, 20	60, 72	16.00¢
8 to 16	48, 60, 72	16.50¢
7	48, 60	17.75¢
6	48, 60	19.00¢
4, 5	40	19.50¢
3	40	20.50¢
2 1/2	24, 30	21.00¢
2	24, 30	23.00¢
CARBON		
40	100, 110	7.50¢
35	65, 110	7.50¢
30	65, 84, 110	7.50¢
24	72 to 104	7.50¢
17 to 20	84, 90	7.50¢
14	60, 72	8.00¢
10, 12	60	8.25¢
8	60	8.50¢

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb.
(Metropolitan area delivery, add 20c to base price except Birmingham,
Cincinnati, Los Angeles, New Orleans and Philadelphia (*), add 15c).

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled			Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Baltimore	5.05	6.24- 8.44 ¹	6.46- 8.46 ²	5.59- 6.89 ¹¹	.....	5.20- 5.64 ¹¹	5.48	5.49- 5.49 ¹¹	6.19	.....	10.05	.....	.....
Birmingham*	5.05 ¹⁰	5.80	6.16 ⁷	5.10 ¹⁰	.....	5.20	5.05	5.00 ¹⁰	6.73	.....	.....	.....	.....
Boston	5.73	6.48 ²⁰ - 6.85	6.79- 7.24 ²¹	5.78	6.90- 6.95	5.88	5.55	5.80	6.02- 6.58	9.70- 9.97	8.50- 10.37	11.15	11.45
Buffalo	5.05	5.80	6.80	5.41	7.27	5.45	5.15	5.05	5.65	9.60	9.90	11.05	11.35
Chicago	5.05	5.80	6.70	5.10	5.45- 6.16	5.20	5.05	5.00	5.65	9.25	9.55	10.70	11.00
Cincinnati*	5.32- 5.97	5.80- 6.24	6.29- 6.39	5.49	.....	5.80- 5.74	5.44- 5.59	5.39- 5.64	6.10- 6.25	9.60- 9.81	9.90- 10.11	11.05- 11.26	11.35- 11.56
Cleveland	5.05	5.80	6.95	5.24	6.35	5.32	5.17	5.12	5.75	9.36	9.66	10.81	11.11
Detroit	5.33	6.08	7.09	5.49	6.27- 6.58	5.59	5.44	5.39	6.03	9.56	9.86	11.01	11.31
Houston	5.75	.....	.....	6.10	.....	6.00	5.95	6.10	7.80	10.35- 10.45	10.50- 10.80	11.50	11.96
Indianapolis	.....	.....	.....	.....	7.36	.....	.....	.....	.....	.....	.....	.....	12.10
Kansas City	5.65	6.40	7.30	5.70	6.95	5.80	5.65	5.60	6.35	9.85	10.15	11.30	11.60
Los Angeles*	5.80	7.00	7.45 ²	5.85	7.35- 7.85 ¹⁶	5.80	5.70	5.80	7.55	10.05	10.20	11.70	12.10
Memphis	5.93	6.68	.....	5.98	6.90	6.08	5.93	5.68	.....	.....	.....	.....	.....
Milwaukee	5.19	5.94	6.84	5.24	6.32	5.34	.....	5.14	5.89	9.39	9.69	10.84	11.14
New Orleans*	5.50 ¹	6.85 ¹	.....	5.55 ¹	6.90 ¹	5.65	5.55 ¹	5.55 ¹	6.75	.....	.....	.....	.....
New York	5.55- 5.65	6.54- 6.64	6.90- 7.00	5.84	6.70 ⁵	5.70	5.45	5.65	6.44	9.60	9.90	11.05	11.35
Norfolk	6.10	7.00	.....	6.30	.....	6.15	6.20	6.15	7.20	.....	.....	.....	.....
Omaha	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Philadelphia*	5.30	6.20	6.70	5.65	6.29	5.45	5.25	5.50	6.31	9.35	9.65	10.80	11.10
Pittsburgh	5.05	5.80	6.70	5.20	6.00	5.20	5.05	5.00	5.75	9.25	9.55	10.70	11.00
Portland	6.60- 7.10 ¹	8.40 ²	8.20 ²	6.85 ⁹	.....	6.50	6.45- 6.45 ⁹	6.60 ¹⁴	12.00 ¹⁸	11.60 ¹⁵	.....	.....	.....
Salt Lake City	5.85	6.70	8.75	7.45	8.75	6.10 ³	5.90	7.35 ⁶	8.75	.....	.....	.....	.....
San Francisco	6.25 ¹¹	7.60 ²	7.50 ²	6.75 ¹¹	8.25	6.15 ¹¹	6.00	6.15 ¹¹	7.80	.....	.....	.....	.....
Seattle	6.70 ⁴	8.15 ²	8.20 ² - 8.35 ²	7.35 ⁴	.....	6.35 ⁴	6.20 ⁴ - 6.25 ⁴	6.35 ⁴	8.50 ¹⁴	.....	10.60 ¹⁵ - 11.60 ¹⁵	.....	13.60 ¹⁵ - 14.60 ¹⁵
St. Louis	5.38	6.13	7.03	5.43	6.68- 7.54	5.53	5.38	5.33- 5.35	6.08	9.58	9.88	11.03	11.33
St. Paul	5.76	6.51	7.41	5.81	6.16- 6.82	5.91	5.76	5.71	6.42	9.96	10.26	11.41	11.71

BASE QUANTITIES: (Standard unless otherwise keyed on prices).

Hot-rolled sheets and strip, hot rolled bars and bar shapes, structural shapes, plate, galvanized sheets and cold-rolled sheets: 2000 to 9999 lb. Cold-finished bars: 1000 lb or over. Alloy bars: 1000 to 1999 lb.

All HR products may be combined to determine quantity bracket. All galvanized sheets may be combined to determine quantity bracket. CR sheets may not be combined with each other or with galv. sheets to determine quantity bracket.

Exceptions:

(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 to 5999 lb; (6) 1000 lb and over; (7) 500 to 1499 lb; (8) 400 lb and over; (9) 400 to 9999 lb; (10) 500 to 9999 lb; (11) 400 to 9999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 9999 lb; (16) 6000 lb and over; (17) up to 1999 lb; (18) 1000 to 4999 lb; (19) 1500 to 3499 lb; (20) CR sheets may be combined for quantity; (21) 3 to 24 bundles.

PIG IRON PRICES

Dollars per gross ton. Delivered prices do not include 3 pct tax on freight.

PRODUCING POINT PRICES						DELIVERED PRICES (BASE GRADES)							
Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Producing Point	Rail Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	48.00	48.50	49.00	49.50	.....	Boston	Everett	\$0.50 Arb.	.....	50.50	51.00	.....	.....
Birmingham	41.88	42.38	.....	.....	.....	Boston	Steelton	6.80	.....	52.79	53.29	53.79	60.90
Buffalo	46.00	46.50	47.00	.....	.....	Brooklyn	Bethlehem	4.29	48.58	49.08	.....	.....	.....
Chicago	46.00	46.50	46.50	47.00	.....	Cincinnati	Birmingham	6.70	.....	51.13	51.63	52.13	.....
Cleveland	46.00	46.50	46.50	47.00	51.00	Jersey City	Bethlehem	2.63	.....	51.13	51.63	52.13	.....
Duluth	46.00	46.50	46.50	47.00	.....	Los Angeles	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Erie	46.00	46.50	46.50	47.00	.....	Mansfield	Cleveland-Toledo	3.33	49.33	49.83	49.83	50.33	54.33
Everett	.....	50.50	51.00	.....	.....	Philadelphia	Bethlehem	2.39	50.39	50.89	51.39	51.89	.....
Granite City	47.90	48.40	48.90	.....	.....	Philadelphia	Swedeland	1.44	49.44	49.94	50.44	50.94	.....
Ironton, Utah	46.00	46.50	46.50	47.00	.....	Philadelphia	Steelton	3.09	.....	.....	.....	.....	57.09
Pittsburgh	46.00	46.50	46.50	47.00	.....	Recherster	Buffalo	2.63	48.63	49.13	49.63	.....	.....
Geneva, Utah	46.00	46.50	46.50	47.00	.....	San Francisco	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Sharpsville	46.00	46.50	46.50	47.00	.....	Seattle	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Steelton	48.00	48.50	49.00	49.50	54.00	St. Louis	Granite City	0.75 Arb.	48.65	49.15	49.65	.....	.....
Struthers, Ohio	46.00	.....	.....	.....	.....	Syracuse	Buffalo	3.58	49.58	50.08	50.58	.....	.....
Swedeland	48.00	48.50	49.00	49.50	.....							
Toledo	46.00	46.50	46.50	47.00	.....							
Troy, N. Y.	48.00	48.50	49.00	49.50	54.00								
Youngstown	46.00	46.50	46.50	47.00	.....							

Producing point prices are subject to switching charges; silicon differential (not to exceed 50c per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct for foundry iron); phosphorus differentials, a reduction of 38c per ton for phosphorus content of 0.70 pct and over manganese differentials, a charge not to exceed 50c per ton for each 0.50 pct manganese

content in excess of 1.00 pct. \$2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.01 to 6.50 pct. C/L per g.t., f.o.b. Jackson, Ohio—\$57.00; f.o.b. Buffalo, \$58.25. Add \$1.00 per ton for each additional 0.50 pct Si up to 17 pct.

Add 50c per ton for each 0.50 pct Mn over 1.00 pct. Add \$1.00 per ton for 0.75 pct or more P. Bessemer ferro-silicon prices are \$1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus \$60.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, \$68.56. High phosphorus charcoal pig iron is not being produced.

FERROALLOYS

Ferromanganese

78-82% Mn. maximum contact base price, gross ton, lump size.	
F.o.b. Birmingham	\$174
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont.	\$172
F.o.b. Johnstown, Pa.	\$174
F.o.b. Sheridan, Pa.	\$172
F.o.b. Etna, Clairton, Pa.	\$175
\$2.00 for each 1% above 82% Mn. penalty, \$2.15 for each 1% below 78%.	
Briquets—Cents per pound of briquet, delivered, 66% contained Mn.	
Carload, bulk	10.45
Ton lots	12.05
Less ton lots	12.95

Spiegeleisen

Contract prices gross ton, lump, f.o.b.	
16-19% Mn 19-21% Mn	
3% max. Si 3% max. Si	
Palmerston, Pa.	\$64.00 \$65.00
Pgh. or Chicago	65.00 66.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.	
96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.	
Carload, packed	35.5
Ton lots	37.0

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.	
Carloads	28
Ton lots	30
Less ton lots	32

Low-Carbon Manganese

Contract price, cents per pound Mn contained, lump size, delivered.	
Carloads Ton Less	
0.07% max. C, 0.06% P, 90% Mn	25.25 27.10 28.30
0.10% max. C	24.75 26.60 27.80
0.15% max. C	24.25 26.10 27.30
0.30% max. C	23.75 25.60 26.80
0.50% max. C	23.25 25.10 26.30
0.75% max. C	
7.00% max. Si	20.25 22.10 23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.	
Carload bulk	8.95
Ton lots	10.60
Briquet, contract basis carlots, bulk delivered, per lb of briquet.	10.30
Ton lots	11.90
Less ton lots	12.80

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Waukegan, Wash., \$77.00 gross ton, freight allowed to normal trade area; Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$73.50. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 for each 0.50% Mn over 1%.	
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Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.	
96% Si, 2% Fe	20.70
97% Si, 1% Fe	21.10

Silicon Briquets

Contract price, cents per pound of briquet, bulk, delivered, 40% Si, 1 lb Si briquets.	
Carload, bulk	6.30
Ton lots	7.90
Less ton lots	8.80

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size, bulk, in carloads, delivered.	
25% Si	17.00
50% Si	11.30
75% Si	13.50
85% Si	14.65
90-95% Si	16.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

Ton lots	\$2.05	\$2.95	\$3.75
Less ton lots	2.40	3.30	4.55

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered.	
(65-72% Cr, 2% max. Si)	
0.06% C	28.75
0.10% C	28.25
0.15% C	28.00
0.20% C	27.75
0.50% C	27.50
1.00% C	27.25
2.00% C	27.00
65-69% Cr, 4-9% C	20.50
62-66% Cr, 4-6% C, 6-9% Si	21.35
Briquets—Contract price, cents per pound of briquet, delivered, 60% chromium.	
Carload bulk	13.75
Ton lots	15.25
Less ton lots	16.15

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, delivered.	
High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.	
Carloads	21.60
Ton lots	23.75
Less ton lots	25.25
Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.	
Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

Chromium Metal

Contract prices, per lb chromium contained, delivered, ton lots.	
97% min. Cr, 1% max. Fe.	
0.20% max. C	\$1.09
0.50% max. C	1.05
9.00 min. C	1.04

Calcium-Silicon

Contract price per lb of alloy, lump, delivered.	
30-33% Ca, 60-65% Si, 3.00% max. Fe.	
Carloads	17.90
Ton lots	21.00
Less ton lots	22.50

Calcium-Manganese-Silicon

Contract prices, cents per lb of alloy, lump, delivered.	
16-20% Ca, 14-18% Mn, 53-59% Si.	
Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

CM52

Contract price, cents per pound of alloy, delivered.	
Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.	
Alloy 5: 50-56% Cr, 4-6% Mn, 18.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.	
Ton lots	19.75
Less ton lots	21.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.	
Ton lots	15.75¢
Less ton lots	17.00¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.	
Carload packed	17.00¢
Ton lots to carload packed	18.00¢
Less ton lots	19.50¢

SMZ

Contract price, cents per pound of alloy, delivered. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, 1/2 in. x 12 mesh.	
Ton lots	17.25
Less ton lots	18.50

Other Ferroalloys

Alsilfer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	7.65¢
Ton lots	9.05¢
Calcium molybdate, 45-40%, f.o.b. Langeloth, Pa., per pound contained Mo.	96¢
Ferrocolumbium, 50-60% contract basis, delivered, per pound contained Cb	
Ton lots	\$2.90
Less ton lots	2.95
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo.	\$1.13
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$3 unitage, per gross ton	\$65.00
10 tons to less carload.	75.00
Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti.	\$1.28
Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti.	\$1.40
Less ton lots	1.45
Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, carloads per net ton.	\$160.00
Ferrotungsten, standard, lump or 1/4 x down, packed, per pound contained W, 5 ton lots, delivered.	\$2.25
Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.	
Openhearth	\$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Molybdc oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa.	95¢
bags, f.o.b. Washington, Pa., Langeloth, Pa.	94¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk, lump	11.00¢
Ton lots, bulk, lump	11.50¢
Ton lots, packed, lump	11.75¢
Less ton lots, lump	12.25¢
Vanadium pentoxide, 88-92% V ₂ O ₅ , contract basis, per pound contained V ₂ O ₅ .	\$1.20
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.	
Carload, bulk	6.60¢
Boron Agents	
Contract prices, per lb of alloy, del.	
Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B	\$4.25
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, f.o.b. Suspension Bridge, N. Y.; freight allowed, Ti 15-18%, B 1.00-1.50%, Si 2.5-3.0%, Al 1.0-2.0%.	
Ton lots, per pound	\$6.25¢
Ferroboration, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots	\$1.20
F.o.b. Wash., Pa.; 100 lb and over	
10 to 14% B.	.75
14 to 19% B.	1.20
19% min. B.	1.50
Grainal, f.o.b. Bridgeville, Pa. freight allowed, 100 lb and over.	
No. 1	93¢
No. 6	63¢
No. 79	45¢
Manganese-Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, delivered.	
Ton lots	\$1.67
Less ton lots	1.79
Nickel-Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	
Less ton lots	\$1.80
Silicaz, contract basis, delivered	
Ton lots	45.00¢

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EXPERIENCE?**

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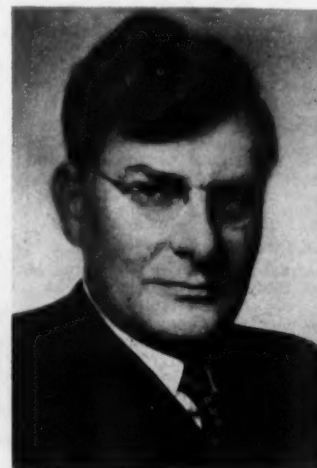
SALES OFFICES: NEW YORK • CHICAGO • CLEVELAND • SAN FRANCISCO

Other Factories at Angola, New York, St. Catharines, Ontario and Johannesburg, S. A.

Iron Age *Introduces*

Continued from Page 23

Mrs. Hermine Asthelm, vice president and general manager of WALDES KOHINOOR, INC., manufacturers of slide fasteners, has resigned after 43 years with the firm. Mrs. Asthelm started her business career at the age of 16 as a stenographer and typist in the European plants of Waldes and shortly afterward became secretary to Henry Waldes, president and co-founder.



ELLIOTT V. BELL, member of the board of directors, Revere Copper and Brass Inc.

Elliott V. Bell, former New York state superintendent of banks, has been elected to the board of directors of REVERE COPPER & BRASS, INC., New York. Mr. Bell, a resident of New York and a former financial writer for the New York Herald-Tribune and the New York Times, was economic adviser to Gov. Thomas E. Dewey, prior to his appointment as state bank superintendent in 1940.

John H. Baninger, assistant chief engineer of the new departure division, GENERAL MOTORS CORP., Bristol, Conn., has retired. Mr. Baninger is an authority on ball bearing applications, particularly in the machine tool field.

Walter F. Knebusch has been appointed director of manufacturing for HARRIS-SEYBOLD CO., Cleveland. Mr. Knebusch has been works manager of the company's Harris division plant in Cleveland since 1943.



"We put 73 SPEED CLIPS* 'On the shelf' and Saved 67% of Assembly Cost!"

REPORTS BORROUGHS MFG. CO.
KALAMAZOO, MICHIGAN

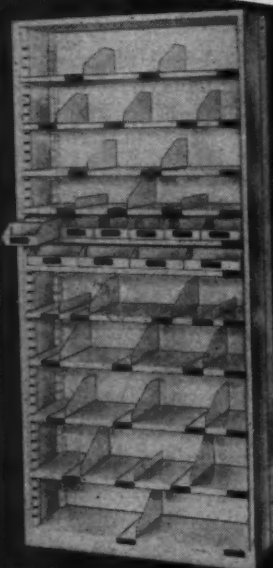
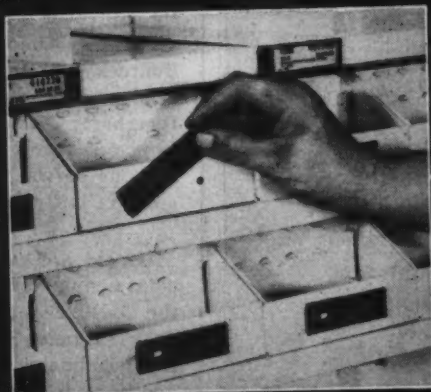
Attaching cardholders to stock bin shelves can become a very important assembly detail . . . especially when you discover that your present method costs you *three times* as much as it should.

Borroughs Manufacturing learned this about the cardholders on their automotive parts bins when they began using SPEED CLIPS on the same job. These special Tinnerman fasteners immediately produced several benefits: They cut down the number of assembly steps . . . released

welding and press equipment . . . reduced material costs 30% . . . and provided a *total assembly savings of 67%*.

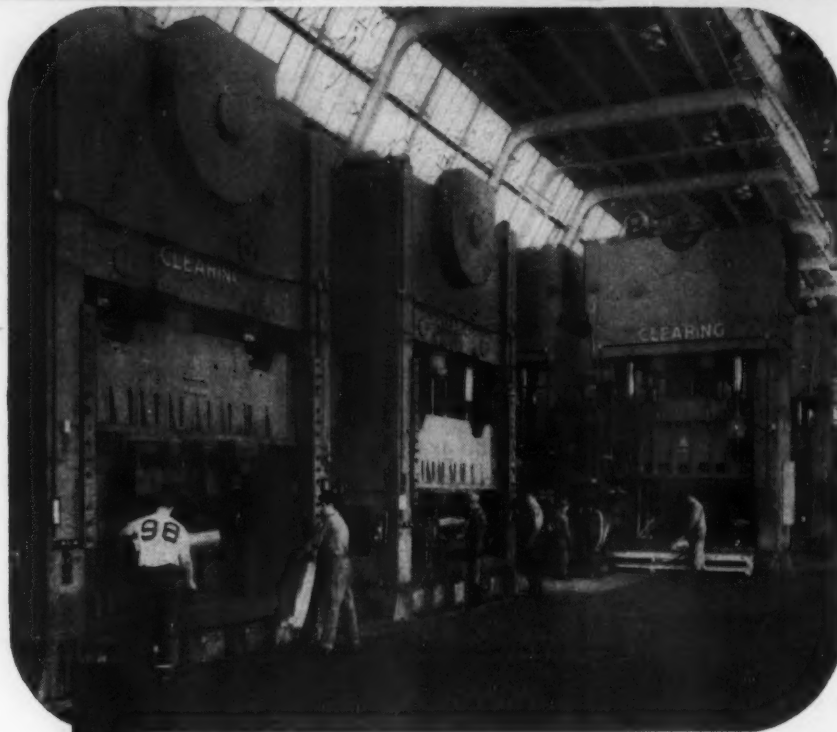
Let Tinnerman SPEED NUT brand fasteners go to work for you. Your Tinnerman representative can tell you how. And our new booklet, "SPEED NUT Savings Stories" supplies proof of results. Write for your copy. TINNEMAN PRODUCTS, INC., Cleveland 13, Ohio. In Canada: Dominion Fasteners Limited, Hamilton.

Assembler positions long tab of clip in first hole, then snaps short tab into second hole to lock part in place. Clips on upper shelves perform additional function of positioning partitions.



New Borroughs Stock Bin for handy, efficient storing of a wide variety of automotive parts.

Speed Nuts



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FOR EFFICIENT PRODUCTION

Whenever you see a lineup of Clearing presses like this one in the Studebaker plant at South Bend, you know the management is going after profits by aggressive production. Indeed, with competitive conditions putting effective restraint on selling price, you've got to hold costs down if you expect to get volume business.

As Studebaker and so many other leading manufacturers know, they'll get top production efficiency from Clearing presses. Accurate stampings, thanks to Clearing precision, will assemble easily and contribute to lower costs all down the line.

Because these are provable facts, you'll find more and more of the world's stamping work—large and small—being done on Clearing presses. Let us show you how a Clearing press, or several of them, can step up production efficiency in your plant. It costs you nothing to consult our engineers.

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IRON AGE INTRODUCES

Continued

C. W. Fuller, of the GENERAL ELECTRIC COMPANY'S apparatus department, Schenectady, was transferred to the staff of the manager of manufacturing. N. E. Firestone, was appointed staff assistant to the manager of manufacturing; K. O. Schulte, manager of wage rate; W. H. Bobear, manager of purchasing; T. F. Garahan, production manager; K. N. Bush, assistant production manager; and A. V. Feigenbaum, supervisor of training, manufacturing personnel.



WARD DOUGHERTY, sales engineer, machine division, Osborn Mfg. Co.

Ward Dougherty has been appointed sales engineer, machine division, OSBORN MFG. CO., Cleveland. He will cover a territory consisting of southwest Ohio, southern Indiana, Kentucky, Missouri and Kansas, with headquarters in Cincinnati. Mr. Dougherty has been with the company for over 24 years. During that time he served in various capacities, most recently in the export division.

Donald S. Leonard received the appointment as sales representative for the UNITED STATES GRAPHITE CO., Saginaw, Mich., and will make his headquarters in Pittsburgh. In addition to the territory in and around Pittsburgh, Mr. Leonard has been assigned a territory including northwestern Pennsylvania, a portion of Maryland, Virginia and West Virginia.

Wilbur J. Kupfrian, part owner and engineering director of the ELLIOTT MFG. CO., Binghamton, N. Y., has withdrawn from the firm to establish the KUPFRIAN MFG. CO. with offices at the same address.

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N. Bush,
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CHARLES B. BROWN, building products manager, Kaiser Aluminum & Chemical Sales, Inc.

Charles B. Brown, has been named building products manager of KAISER ALUMINUM & CHEMICAL SALES, INC., Oakland, Calif.

Ferdinand Schmitz has resigned as vice president of PACIFIC CAR & FOUNDRY CO., to accept a position as vice president of SEATTLE STEEL CO. and INLAND EMPIRE STEEL CO. T. B. Munson, who has been serving as works manager at Pacific Car, has been appointed vice president in charge of operations.

Regis O'Brien has been appointed by the SHEFFIELD STEEL CORP., Kansas City, as its representative in the states of Washington and Oregon for the bolt and nut division. Mr. O'Brien has been associated with the steel business for many years in the Pacific Northwest. He will make his offices in Portland, Oregon.

John S. Thompson and Robert H. Madden, Jr., have been named assistant managers of sales for the central sales division of COLUMBIA STEEL CO., with offices in San Francisco. Mr. Thompson joined Columbia in 1932 and Mr. Madden in 1933.

L. G. Johnson, formerly in the sales department of Republic Steel, has been placed in charge of the newly opened sales office of KAISER STEEL CORP., Houston, Tex.

Alfred O. Weiland has been named general manager of the Lima Works, LIMA-HAMILTON CORP., Lima, Ohio.

William Steinwedell has become associated with the WOLF MANAGEMENT ENGINEERING CO. of Chicago.

Save ^{up to} 40%
on melting metals*



***KEMP...Immersion Pots Melt Metal Under Ideal Conditions—Control Degree, Rate and Distribution of Heat, Limit Dross Formation**

NO MATTER WHAT soft metals you heat: lead, pewter, tin or salt—for coating, annealing, tempering or a special application—your plant needs Kemp Immersion Heating! Take heat recovery as an index of Kemp's amazing performance. A full 12 ton Kemp pot, out of service for two days, can be brought to 600° F. in less than two hours!

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Even if your melting equipment is large enough for the job . . . when you replace with Kemp you're money ahead. No brickwork to steal heat . . . no external combustion

chamber . . . no carbon monoxide . . . no temperature overrun. You get high melting rates, reduced dross formation, speed of temperature recovery after adding cold material . . . PLUS an estimated fuel saving of up to 40%!

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The famous Kemp Carburetor . . . part of each installation . . . assures complete combustion, reduces installation costs, makes your melting operation profitable. Get the facts. Find out how much you can save. Fill out coupon and send for special bulletin.

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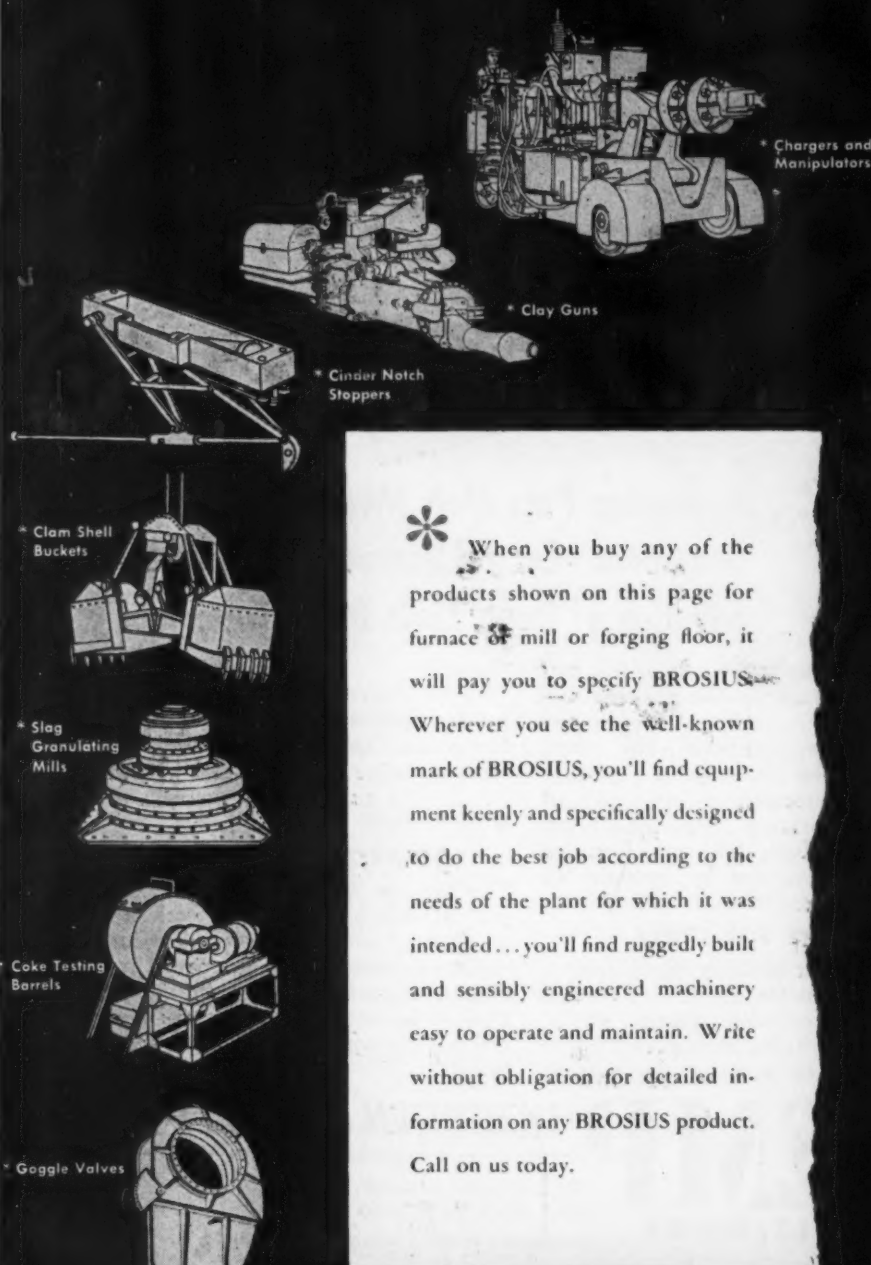
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IRON AGE INTRODUCES

Continued



J. PHILIP MURPHY, president, Judson Pacific Murphy Corp.

J. Philip Murphy was elected president of the JUDSON PACIFIC MURPHY CORP., Emeryville, Calif.

Leroy Dougall was transferred from headquarters office of VAPOR HEATING CORP., Chicago, to work out of the St. Paul-Minneapolis office. Mr. Dougall will work with railroads on service problems in Minnesota, Iowa, Wisconsin, the Dakotas and Washington.

George H. Hodapp was recently elected president of HELLER BROTHERS CO., which maintains factories in Newcomerstown, Ohio, and Newark, N. J. James G. Henry, Jr., was elected vice president and secretary; Miss Anna W. Ibach, treasurer, and Eugene M. Steenburgh, assistant secretary.

George L. Carr, for the past 13 years with APEX BROACH CO., Detroit, has resigned as vice president and sales manager of that company and has been appointed assistant to the sales manager of COLONIAL BROACH CO., Detroit.

J. D. Harvey, general purchasing agent and manager of the export division of BENEDICT MFG. CO., East Syracuse, N. Y., has been elected president of the J. D. HARVEY CORP., a subsidiary of the Transpacific Company of New York City.

Paul V. Clarke, of Pittsburgh, has been appointed sales representative in the western Pennsylvania territory for STAR TUBULAR PRODUCTS CO., Chicago.

Edward G. Fenton was named superintendent of the ALAN WOOD STEEL CO.'S new \$9,000,000 hot rolled strip mill in Conshohocken, Pa. Mr. Fenton has been superintendent of the company's Schuylkill Iron Works since 1936—a post to which he was named shortly after he joined the Alan Wood organization.

Bruce E. Miller received the appointment as local area advertising manager for the HUDSON MOTOR CAR CO., Detroit. Miller comes to Hudson after four years with the Packard Motor Car Co. In his last post he was special sales representative in the Boston zone and previously saw service in the sales promotion and advertising departments.



ROY A. CURL, manager, promotion department, Youngstown Sheet & Tube Co.

Roy A. Curl was named manager of YOUNGSTOWN SHEET & TUBE CO.'S sales promotion department, succeeding Myron S. Curtis who recently was appointed assistant to the president. He joined the company in 1925 and for the last 15 years has been assistant to the sales promotion manager.

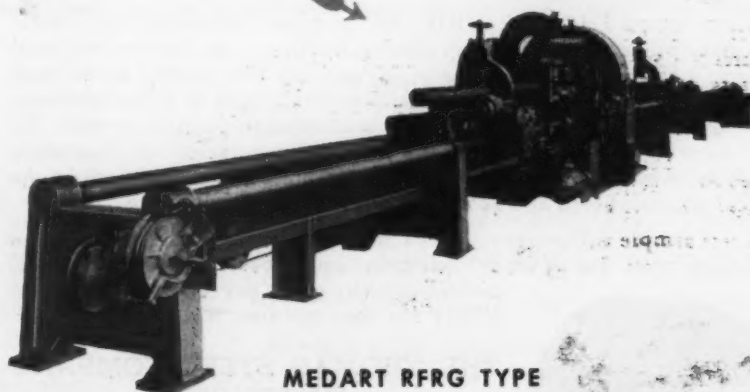
George H. Brodie was appointed a vice president in charge of coordinating operations for PACKARD MOTOR CAR CO., Detroit. Mr. Brodie has held the title of assistant to the president since 1945. He came to Packard in 1907 as a clerk in the engineering department.

Guy A. Baker has been appointed vice president of manufacturing for the EURION CO., INC., Dayton. During his twenty years association with the company, he has been active in metallurgical research and development. R. Merton Shields was appointed secretary.

A NEW BAR AND TUBE TURNER

- ✓ ... automatic centering with roll-type positive continuous feed
- ✓ ... separate drives for cutting tool and bar feed for infinite ratios
- ✓ ... two individual automatic-grip carriages
- ✓ ... production on rough peel or precision work
- ✓ ... 100% chip recovery

The new Medart RFRG type turning machine gives the exact ratio between cutting speed and bar feed rate for superior finish and close tolerance in precision turning, and high production on rough peeling or scalping. Speed and range of materials turned is limited only by the capacity of present day cutting tools. This new machine is completely push-button operated, and its improved, direct drive is actually simpler ... easier to operate!



MEDART RFRG TYPE





"Gad...
'BREAK-EVEN'
...Plunkett!"

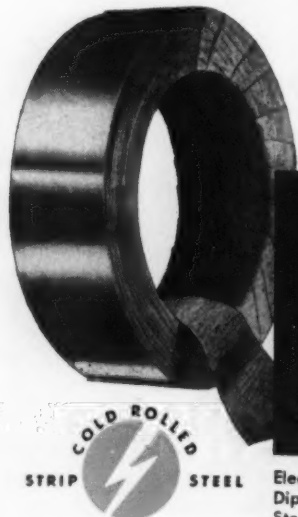
Are you at the very brink of your "break-even"? Are you hanging onto profits by a measly juvenile juniper? Wait... your situation is far from hopeless! You've a couple of ways to climb into the clear: Drive costs safely down—Pull sales up. Pre-coated THOMAS STRIP can help you do both at the same time.

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Ready-to-fabricate THOMAS STRIP streamlines production and cuts costs all along the line. It combines the beauty and utility of chromium, nickel, brass, copper, zinc, tin, lead alloy and lacquer coatings with the economy of steel. It gives your products the definite competitive advantages of lower unit costs, smart appearance and lively consumer acceptance.

Brass coated THOMAS STRIP, for example, eliminates much costly surface preparation, cleaning, plating, buffing... and gives fabricated parts a uniform brass coating *inside and out*. The coating lends itself readily to forming and drawing and to production of rolled sections. It affords good protection against corrosion to parts in process. Its surface can be readily oxidized to provide a variety of decorative effects. Available natural, planished and buffed, it serves both as the final product finish and as an ideal base for further plating.

A test sample will suggest dozens of ideas for improving products and cutting costs. Let us study your plant and process to recommend the *metallurgically right* pre-coated THOMAS STRIP for your test run. Write today:



THE THOMAS STEEL COMPANY
WARREN, OHIO
Specialists in Cold Rolled Strip Steel

Thomas Strip

SPEEDS PRODUCTION... CUTS COSTS



Electrocoated with Chromium, Nickel, Brass, Copper and Zinc • Hot Dipped Tin and Lead Alloy • Lacquer Coated in Colors • Alloy Strip Steel • Uncoated Strip Steel • Produced to Your Specifications.

IRON AGE INTRODUCES

Continued

William S. Morris, vice-president of the American Locomotive Co., and James Macdonald, vice president of General Steel Castings Corp., were elected members of the Board of Directors of GENERAL STEEL CASTINGS CORP., Granite City, Ill.



CLYDE M. HORAN, superintendent, blast furnaces, Youngstown Sheet & Tube Co.

Clyde M. Horan has been transferred from Indiana Harbor to the Youngstown district as superintendent of YOUNGSTOWN SHEET & TUBE CO.'S blast furnaces at Campbell and Hubbard and sintering plant at Campbell. For the last nine years he has been superintendent of blast furnaces at the company's plant in Indiana Harbor.

Harry A. Croasdale was named manager of the Penn-Jersey lamp sales division of WESTINGHOUSE ELECTRIC CORP., a district which includes eastern Pennsylvania, south Jersey, Delaware and the eastern shore of Maryland. Mr. Croasdale joined the company as a lamp salesman in 1925. Edward S. Barrington takes over as manager of the Chesapeake lamp sales division with headquarters in Baltimore, covering Maryland, northern Virginia, eastern West Virginia and the District of Columbia. Mr. Barrington was formerly lamp manager for the Philadelphia metropolitan area. The Virginia lamp sales division, with headquarters in Richmond, Va., will be headed by John C. Downing.

Arthur Schwarz of the NOOTER CORP., St. Louis, was appointed to the position of vice president in charge of sales.

Turn to Page 159

FLUXING

GALVANIZING

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FLUORIDES

for Dependable Industrial Performance

ENAMELING

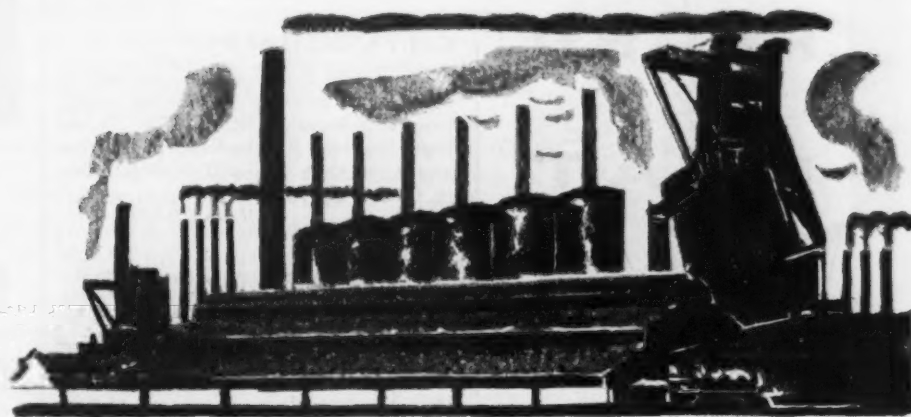
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Harshaw produces a comprehensive group of fluorine compounds to serve a long list of varied metal working industries. The top performance ranking of Harshaw fluorides is the result of rigidly controlled uniformity and quality. Send your order to the nearest branch office for immediate delivery.



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THE HARSHAW CHEMICAL CO.

1945 East 97th Street, Cleveland 6, Ohio
BRANCHES IN PRINCIPAL CITIES

February 9, 1950

133

PAGE WIRE

LOW CARBON
HIGH CARBON
STAINLESS
SPECIAL ALLOY
ARMCO IRON

ROUND

FLAT

OR

SHAPED

You draw the Shape

—Page can draw the Wire

—the way you want it for your production—whether it's ALL of your product, or only a part.

Cross-sectional areas up to .250" square; widths to 3/8"; width-to-thickness ratio not exceeding 6 to 1.

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Information about Wire—**

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with Page!*



T Dear Editor

FAVORABLE

I have just read "The Welfare State versus Personal Initiative," in the January 5 issue. Would it be convenient for you to send me two or three reprints of this article? I think Mr. Campbell's article is very interesting and points out very effectively the dangers that are lurking in our pathways.

L. B. SWIFT
President

Taylor Instrument Companies
Rochester, N. Y.

Copies have been sent.—Ed.

GALVANIZED SCRAP

We notice that you have not shown the market price of galvanized scrap, loose and bundled, lately. This is one item that we like to keep posted on, and hope that you will include same in future issues.

H. B. FREELAND

Freeland Sons Co.
Sturgis, Mich.

At present—and particularly in Detroit—most galvanized scrap finds its way into No. 2 bundles. If the galvanized coating is too heavy they are down-graded to No. 3 bundles. There is so little tonnage of No. 3 and No. 2 bundles that we do not believe there is enough trading to assure us of quoting them accurately each week.—Ed.

FACTS ISSUE

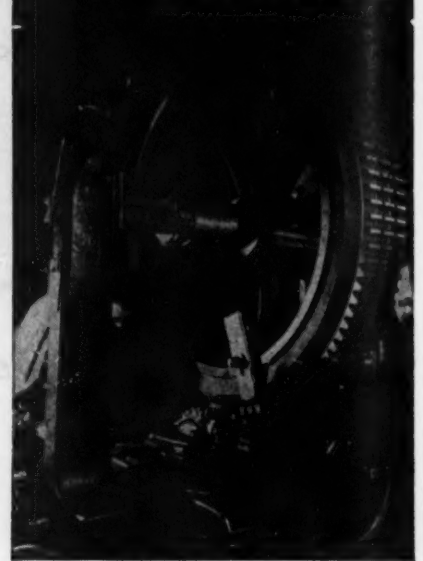
We congratulate the entire staff of THE IRON AGE on the excellent 95th Annual Review. It is chock full of useful facts and data, and is a very worthwhile reference to have at hand. We have one question, however. The Society maintains an accurate mailing list of about 2300 captive and jobbing gray iron foundries in the U. S. On p. 136, we notice that you list a gray iron foundry (employing over 21 workers) in Wyoming, which, according to our records, is barren of gray iron with the exception of a small set-up at the University of Wyoming, which we don't count. We would appreciate receiving the details on this Wyoming foundry. It is a subject that comes up quite often.

D. H. WORKMAN
Promotion Manager

Gray Iron Founders' Society, Inc.
Cleveland

Our records indicate that the company in question makes agricultural implements. It is quite possible that the foundry itself may not be an integral part of the plant at Torrington, Wyo., but may be in a separate location in Gering, Neb., which is just a few miles away. However, this would put the actual foundry in another state.—Ed.

LARGE CUT GEARS



Cutting three identical spur gears simultaneously at Simonds Gear.

Cut Gears for Industrial Needs!

For special gears in larger sizes—exact duplicate gears for replacements—for every heavy-duty industrial gear application—look to SIMONDS GEAR where specialty gears for heavy industry have been a custom service for more than 50 years. Within easy shipping distance of many heavy industry plants—with a personalized service designed to meet your most exacting specifications—SIMONDS GEAR provides an unusually prompt and efficient service on even the most unusual gear requirements. Sizes range up to 145" dia. in all popular gear-making materials. Send your inquiry today and get acquainted with SIMONDS GEAR Service.

SPUR GEARS

BEVEL GEARS • MITRE GEARS
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Stock carrying distributors for Ramsey Silent Chain Drives and Couplings. V-Belts.

THE
SIMONDS
GEAR & MFG. CO.

LIBERTY at 25th PITTSBURGH 22, PA.

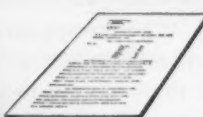
a NEW STAINLESS STEEL has been invented by *Carpenter*...



This new Chrome-Nickel Stainless can do things that the 18-8's can't do. Invented in Carpenter's laboratories, it is an austenitic steel *with an extremely slow rate of work-hardening.*

We call the new steel *Carpenter Stainless No. 10.* Its slow rate of work-hardening eliminates fabricating problems often encountered with the 18-8 grades of Stainless. The development of No. 10 makes practical for the first time the economical production of many kinds of Chrome-Nickel Stainless parts, such as recessed head screws and upset nuts.

Carpenter Stainless No. 10 can be cold worked much easier than Type 302 Stainless. Its corrosion resistance is equal to and in some cases better than the 18-8 types.



A technical bulletin describing Carpenter Stainless No. 10 will be mailed if you will drop us a line on your company letterhead. The bulletin will help you get to know this new Stainless, recently invented in Carpenter's laboratories.

Economical production of many Chrome-Nickel headed parts has been made possible by Carpenter's invention of a new Stainless Steel that has a very slow rate of work-hardening.

THE CARPENTER STEEL COMPANY, 121 W. Bern Street, Reading, Pa.
Export Department: 233 Broadway, New York 7, N. Y. "CARSTEELCO"



Carpenter



STAINLESS NO. 10

(Patent Pending)

FOR COLD HEADED AND UPSET PARTS

Type Analysis: Carbon...0.08% max. Chromium...16.00% Nickel...18.00%

NEW BAKER FORK TRUCK

MODEL FT

Costs less to buy—Does more work per dollar because of its

**100%
Functional
Design**

CAPACITY—3,000 and 4,000 pounds.

WEIGHT—with battery—6,600 and 7,500 pounds.

WIDTH—35 inches.

TURNING—Operates in 64 inch intersecting aisles with 36 inch forks. Outside turning radius 73 inches.

SPARK ENCLOSED CONSTRUCTION

— available at extra cost for safe intermittent operation in gas and dust laden surroundings.



**126 INCH
TELESCOPING LIFT**
64 in. single lift, 63 in. free lift, with 83 in. overall height. Low-pressure hydraulic system.

GREATER VISIBILITY

Due to off-center position of operator and design of dash panel and uprights.

OPERATOR CONVENIENCE

Comfortable padded seat and backrest. Entry from either side. Automotive type steering wheel. Control levers to right of wheel.

UPRIGHT GUIDES

Welded unit assembly. Minimum increase in overall height when tilting. Interchangeability of uprights permits highway truck or boxcar loading, and extremely high tiering, with the same truck.

NO-PLUG CONTROLLER

Drum type, direction selected by manual control, 5 speed foot-operated accelerator. Impossible to plug. Dead man control.

SOFT-TOUCH BRAKES

Air-cooled drum type, mechanical. Mounted on motor shaft. Dynamic braking in varying degree obtained by reversing controller and advancing accelerator.

CUSHION TIRES

Provide a softer ride, longer wear, high power efficiency and greater traction.

WORM DRIVE AXLE

Exclusive rugged and simple design for maximum efficiency and long life.

BAKER-BUILT MOTORS

Travel and auxiliary motors designed by Baker specifically for truck application.

WIDE ANGLE STEER

Heavy-duty, automotive type shock-proof steer. Knuckle-type axle with rubber-mounted longitudinal pivot provides compensation for uneven roadways.

ALL-STEEL FRAME

Heavy gauge, unit-welded with steel plate bumper counterweight for greater rigidity and strength.

**Learn How Little
This Truck Costs!**

Write for full descriptive data and prices and see for yourself why the Baker FT costs less to buy and does more work per dollar because of its 100% functional design.

BAKER INDUSTRIAL TRUCK DIVISION

of The Baker-Raulang Company

1227 WEST 80th STREET • CLEVELAND 2, OHIO

Baker INDUSTRIAL TRUCKS

FREE

PUBLICATIONS

Continued from Page 34

metal, and shows typical examples of Well-Cast castings, covering a wide range of uses. *Wellman Bronze & Aluminum Co. For more information, check No. 10 on the postcard on p. 35.*

Roller Chain

Bulletin 49-2, entitled "Unusual Applications of Roller Chains," suggests the broad application of roller chain by means of 24 pages of photos, descriptions and working drawings of unusual applications. *Chain Belt Co. For more information, check No. 11 on the postcard on p. 35.*

Safety Training

Written primarily for use of rail transportation employees of companies having their own rail facilities, a 50-p. pocket booklet contains illustrations and instructions for safely performing train-handling duties. *Armco Steel Corp. For more information, check No. 12 on the postcard on p. 35.*

Lift Truck

Catalog 1135 contains eight pages of model views, action photographs and descriptive text of the new Hyster Model 20, 2000 lb capacity lift truck, and includes specifications for the new model. *Hyster Co. For more information, check No. 13 on the postcard on p. 35.*

Steam Generator

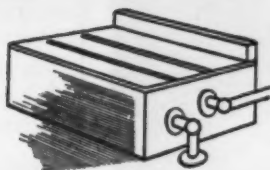
The GEMS steam generator, a compact self-contained unit for installation in locations having limited floor space or headroom, is described in an 8-p. catalog giving specifications for this factory-assembled steam plant. *Edge Moor Iron Works, Inc. For more information, check No. 14 on the postcard on p. 35.*

Resume Your Reading on Page 35

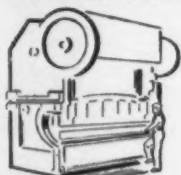
**Simplify production
with economical
vapor degreasing**



BEFORE INSPECTION



BEFORE PLATING



AFTER STAMPING



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BEFORE AND AFTER production steps, Vapor Degreasing can save you time and cost. In one operation, in one minute or less, it thoroughly removes grease and oil from parts made of most materials—of any size or shape. And it reaches almost inaccessible places . . . leaves parts clean, warm and dry.

**Get outstanding results
with new, improved
"Triclene" D Trichlorethylene**



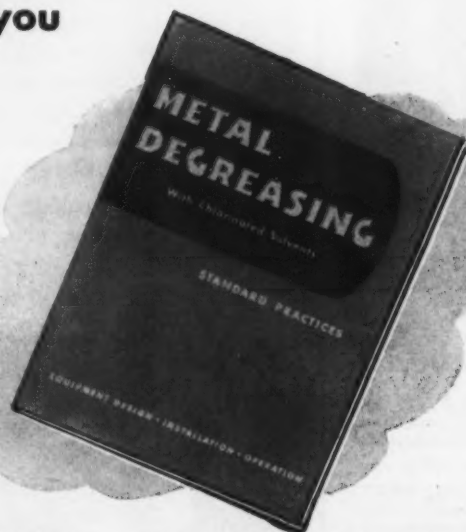
"TRICLENE" D is the most stable grade of Trichlorethylene yet developed by Du Pont for metal degreasing. It stands up against contaminating and destructive materials which may be introduced in degreasing . . . assists materially in carrying out efficient cleaning.



INTRODUCING "PERCLENE" D

A new degreasing grade of Perchloroethylene for use in metal drying and other vapor degreasing operations in which a higher boiling solvent may be desirable.

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tell you**



READ HOW Vapor Degreasing can simplify production . . . save you time and unnecessary costs. Read why the results obtained can't be matched by any other method. It shows typical compact equipment available for efficient and economical operation. And it gives information about solvents used in this equipment—Du Pont "Triclene" D Trichlorethylene, and Du Pont Trichlorethylene and Perchloroethylene—which under various trade marks have been widely used for many years. Send for it today!

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Electrochemicals Dept., Wilmington 98, Delaware

Please send me my copy of "Metal Degreasing—
Standard Practices."

Name _____

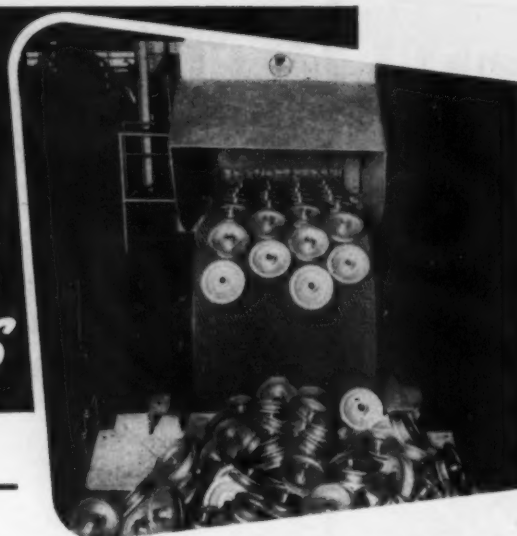
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cut material, tooling and finishing costs

● For instance, brazing a disc on the end of a tube may use 75 to 80% LESS material than if the hollow flanged part is cut from the solid. Finishing costs are low too, because the assemblies are discharged smooth and scale-free.



Brazing also avoids localized overheating, distortion and the cost of straightening. It's ideal for most any size, shape or quantity requirement.

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FOR ANY PROCESS, PRODUCT OR PRODUCTION

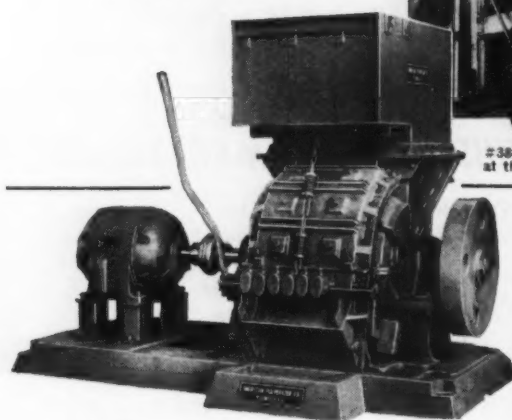
Salem - Ohio

SOLVE SCRAP PROBLEMS PROFITABLY

with an
**AMERICAN RING
METAL TURNINGS
CRUSHER**



Metal turnings reduced to uniform chips by an American #3800 Crusher are collected for oil reclamation at the Link-Belt Co.'s Ewart Plant, Indianapolis.



Reduced into uniform chips by American shredder ring action, long, curly turnings of steel, aluminum, brass, etc., release valuable cutting oil much more freely—30 to 50 gallons per ton! Add the savings in storage and handling—plus the higher scrap value of short shoveling turnings—and it's easy to see why Americans pay for themselves . . . over and over again.

Send for your copy of
"Crushing Turnings Profitably."

American PULVERIZER COMPANY
*Originators and Manufacturers of
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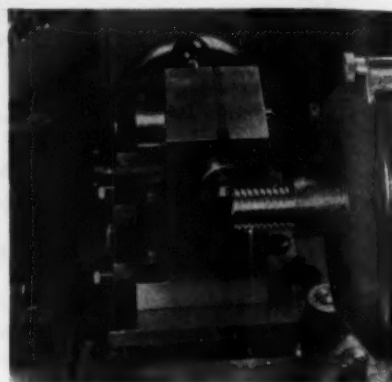
1439 MACKLIND AVE.
ST. LOUIS 10, MO.

NEW

PRODUCTION IDEAS

Continued from Page 38

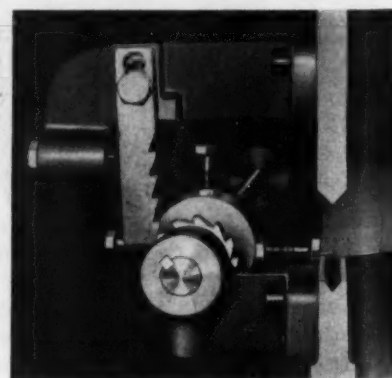
to shoulders without the necessity for close attention by the operator. A spring release mechanism is cocked by a handle to move the tool



forward, and released by a positive adjustable screw stop attached to the headstock. The device can be furnished for use at the front of the cross slide, or with extra linkage at the rear. The attachment can be supplied with a knock-off mechanism for semi-automatic operation if desired. *Warner & Swasey Co.* For more information, check No. 29 on the postcard on p. 35.

Press Brake Gage

An automatic, self-indexing rotary type gage for press brakes makes possible the producing of four different bends in a piece of



metal before it leaves the operator's hands. Ease of setting, accurate gaging and a saving of material handling time are claimed for the

gage. The unit consists of a rack and gear assembly which automatically rotates adjustable gage stops into position and holds them securely until bend has been made. The rack, attached directly to the punch, engages the gears and on the upstroke brings stops to position required for the bend. *General Gas Light Co. For more information, check No. 30 on the postcard on p. 35.*

Radiation Detector

A new portable radiation detector, the long-probe Gamma Survey Meter measures radio-activity from a distance. The instrument can be used for monitoring areas in which radioactivity is suspected or for other types of radiation metering. A detector consisting of an electronic tube and a phosphor, is located at the tip of a 4-ft-long probe and



converts radioactive emanations into electrical energy, which indicates amount of radioactivity on the dial held by the operator. The detector is powered by 1000 v induced from batteries contained in a box that can be carried over the operator's shoulder. *General Electric Co. For more information, check No. 31 on the postcard on p. 35.*

Soldering Unit

All types of soldering operations, including silver soldering and brazing is possible with a new soldering unit that operates on the conduction principle. Called the Wassco Glo-Melt, it has a 24 heat selector to handle lightest up to heaviest work. With capacity said to equal a 450 w heavy electric iron, Glo Melt soldering is done with a light handpiece weighing only 5 oz that can be han-



IS YOUR FIRM getting its first taste of battery-powered handling by using one or more motorized hand trucks? Chances are that you're trying out your equipment on all sorts of jobs . . . and realizing in how many ways battery-industrial trucks can speed handling and increase production.

If so, now is the time to become acquainted with long-life EDISON Nickel-Iron-Alkaline Storage Batteries . . . the batteries that give you real dollar economy. Did you know they're electrically foolproof—require no critical adjustment of charge rates—can't be injured by reverse charging, short circuiting or similar electrical accidents? Did you know they're built of rugged steel inside and out to withstand rough usage? Did you know EDISON Service Engineers check your batteries regularly and help you to maintain them in top condition?

EDISON Batteries last and last, and so through the years their superiority costs you less and less. Prove this to yourself by asking the EDISON users in your own vicinity, then profit by their experience.

ADVANTAGES OF EDISON NICKEL-IRON-ALKALINE BATTERIES:
They're mechanically durable; electrically foolproof; quickly and easily charged; simple to maintain; not injured by standing idle.



EDISON

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STORAGE BATTERIES



EDISON STORAGE BATTERY DIVISION

of Thomas A. Edison, Incorporated, West Orange, N. J.

In Canada: International Equipment Co., Ltd., Montreal and Toronto

For Greater

PRODUCTION EFFICIENCY SAVINGS



MODEL HU68 universal joint type drill performing core drilling, reaming and facing operation on forged steel parts

MOLINE TOOL COMPANY
100 20th Street Moline, Illinois

use an individually designed "Hole-Hog" Machine Tool for such jobs as:

- Multi-Spindle Boring
- Single and Multi-Spindle Honing
- Straight Line Multi-Drilling
- Adjustable Spindle Drilling
- Vertical and Way-Type Fixed Center Drilling, Boring and Tapping
- Special Multiple Operation Machine Tools

Our 50 years of Machine Tool Engineering Experience is at your service. Tell us your particular problem.



NEW PRODUCTION IDEAS

Continued

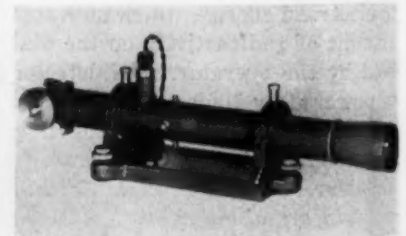
dled as easily and accurately as a pencil. The tip of the copper jacketed carbon pencil glows red and the flux-core solder flows when touched to the pieces being joined. When



removed the work carbon immediately cools. Power is used only when contact is maintained. *Wasserlein Mfg. Co. For more information, check No. 32 on the postcard on p. 35.*

Measuring Instrument

With the Watts 18-in. Auto-Collimator it is possible to produce a chart showing waviness in a surface plate, machine bed or shaft, to an accuracy of 0.00004 in.; and with the use of accessories such as gage blocks, angle gage blocks, reflecting squares, mirrors, etc. a large number of extremely accurate



angular measurements can be taken directly. The instrument produces a beam of parallel (collimated) rays of light and measures to the accuracy of 1/2 sec of arc any deviation between the original direction of the beam and its reflection by a mirror or polished surface. Linear measurements can be determined by simple computation without regard to distance and without wear, distortions due to temperature changes, or other factors affecting

"New Process"

Punches • Dies • Rivet Sets

Compression Riveter Dies

Chisel Blanks

Made from high-grade alloy tool steels properly heat-treated of uniform high quality — may be purchased with complete confidence for maximum service.

Write for Catalog 46

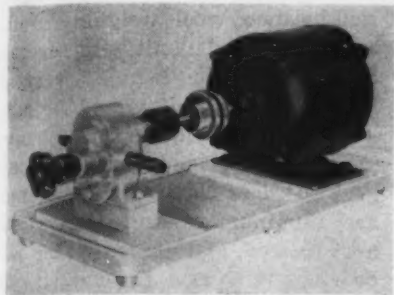
GEO. F. MARCHANT COMPANY

1420-34 So. ROCKWELL ST., CHICAGO 8, ILL.

accuracy of measurement and inspection. Engis Equipment Co. For more information, check No. 33 on the postcard on p. 35.

Stainless Steel Pumps

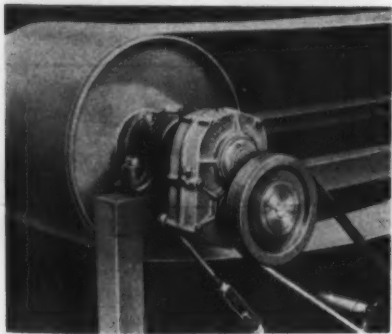
Stainless steel self-priming pumps are available in five sizes, 3, 5, 10, 20 and 30 gpm at zero pounds pressure. The design is compact



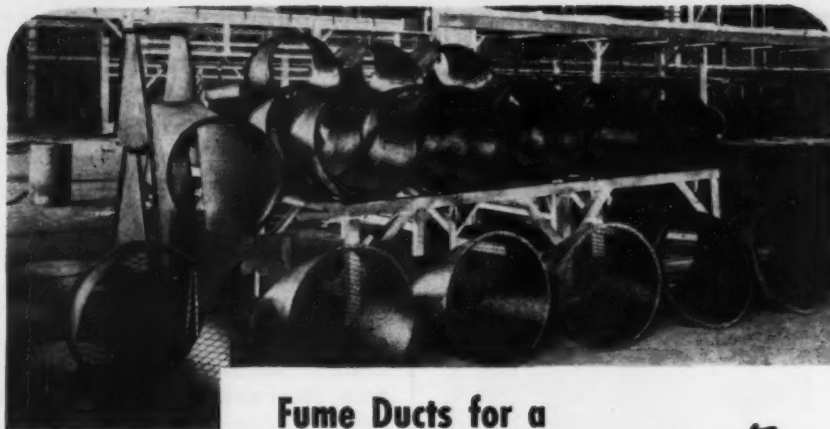
and insures perfect alignment of the moving parts. Pumping capacity is thus continuously maintained. Hand manual by-pass control valves are included on each pump to regulate pressure and flow rate. Pumps are available as individual units or as complete pump assemblies, direct drive or belt driven. Ertel Engineering Corp. For more information, check No. 34 on the postcard on p. 35.

Speed Reducer

Designed primarily for conveyers, bucket elevators, agitators, mixers, feeders and processors, the torque-arm speed reducer consists of a reducer with a fixed ratio of



15:1, driven by a motor through any V belt or flat belt drive. Output speeds from 13 to 133 rpm can be obtained through the use of stock sheaves. The reducer contains a double train of helical steel gears, heat treated and shaved. It is locked to the shaft, on both sides of the unit, by steel locking collars. A torque arm anchors the reducer and provides quick, easy adjustment of



Fume Ducts for a G-E Installation, coated with

This acid, alkali and salt resisting lining for metal or wood fume ducts may be applied by spraying on the job site or where the duct is fabricated. Will withstand vibration and absorb expansion to give years of service. High temperature resistance. Ceilcote products include acid and alkali proof linings, membranes, bonding cements, brick and protective coatings.

*Ceilcote
Spray Grade*

FOR
PLATING
PICKLING
and CHEMICAL
FUME
REMOVAL
SYSTEMS



Corrosion Proof

MATERIALS • CONSTRUCTION • SUPERVISION

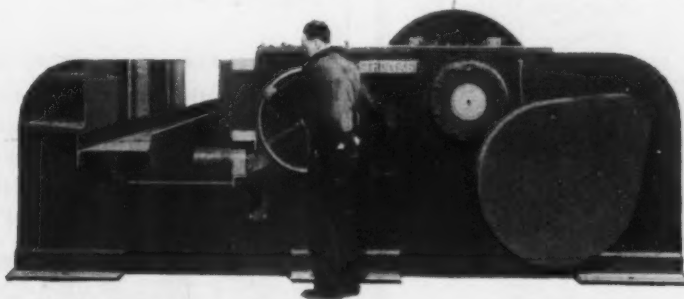
The CEILCOTE Company ROCKEFELLER BUILDING • CLEVELAND 13, OHIO

THOMAS

BENDING AND STRAIGHTENING

THE TREND IS TO THOMAS

Machines



THESE MODERN MACHINES are of all-steel construction and come in various sizes, in capacities from 50 to and including 400 tons. Convenient adjustments for easy, accurate operation.

Write for
Bulletin 315



TOOL and DIE USERS!

**Pangborn
"Hydro-Finish"**

**Can
Help
You...**



It improves surface finish, removes oxide scale, increases tool and die life through proper maintenance. Hydro-Finish is the new versatile impact blasting process that uses a fine mesh abrasive suspended in water and holds tolerances to .0001 inches.

In the Tool Room, Hydro-Finish simplifies the manufacture and maintenance of tools, dies and molds. It reduces usual costly handwork and produces a surface virtually free from directional grinding lines.

In the Production Line, Hydro-Finish eliminates many tedious finishing operations. It reduces cost and time involved in buffing. It improves fatigue life of the metal parts it finishes. It cuts many manufacturing costs.

It can be used for surface finishing, lubrication control, removing discoloration, preparing surfaces for plating; finishing threaded sections, plus many other uses.

Find out today how Hydro-Finish can help you. Write for Bulletin 1400 to PANGBORN CORPORATION, 1201 Pangborn Blvd., Hagerstown, Md.



PANGBORNITE
The best abrasive for all liquid blasting needs.

Available in many mesh sizes.

Look to Pangborn for all the latest developments in Blast Cleaning and Dust Control Equipment.

Pangborn

**BLAST CLEANS CHEAPER
with the right equipment
for every job**

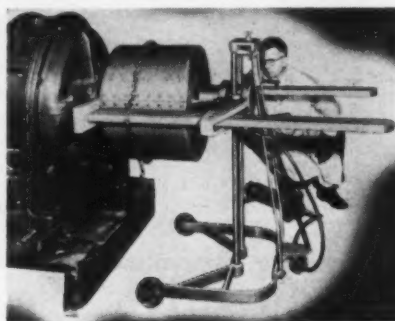
NEW PRODUCTION IDEAS

Continued

the belt tension through the use of a turn buckle. Dodge Mfg. Corp. For more information, check No. 35 on the postcard on p. 35.

Hydraulic Pulley Puller

Built for the toughest pulling jobs, a new heavy-duty portable hydraulic pulley puller, rated at 50 tons pressure, removes large pulleys, wheels, gears, etc., from shafts. Two feet at the ends of adjustable arms are placed behind the



object to be removed and a ram is placed in position against the end of the shaft. Pressure applied by the ram against the shaft by means of a hydraulic jack quickly loosens and removes the object without damage. Pressure exerted by the ram is regulated by a three-speed hydraulic pump. Pulleys 42 in. diam with face width up to 48 in. can be handled. Industrial Engineering Equipment Co. For more information, check No. 36 on the postcard on p. 35.

Clamp Kit

Eleven different neg'ator clamps, new one-piece coil-form gripping devices, are available in a try-it-for-size kit to help research, maintenance, production and display people



investigate possible uses and sizes best suited to their requirements. The assortment includes one each of the standard sizes with clamping pressures from 5 oz to 18 lb, automatic take-up (and constant pressure) out to maximum openings of

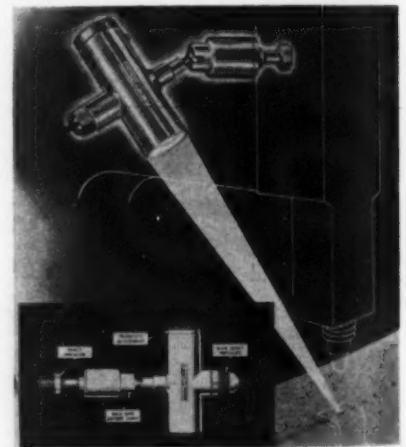
3 1/4 to 20 in., widths from 1/4 to 1 1/4 in. and coil diameters from 5/16 to 2 in. Hunter Spring Co. For more information, check No. 37 on the postcard on p. 35.

Polisher

A new 7-in. Junior polisher has been designed for intermittent service in small shops. It is a light, well-balanced tool weighing 8 lb, has a side handle unit with reversible auxiliary side handle for right hand or left hand use. A spindle locking pin provides speedy changing of bonnets and pads. The no-load speed is 2000 rpm. Housings are aluminum castings, gears are heat treated, and grease-sealed ball bearings are used throughout. A universal motor is provided for operation on either ac or dc. Van Dorn Electric Tool Co. For more information, check No. 38 on the postcard on p. 35.

Locating Spotlight

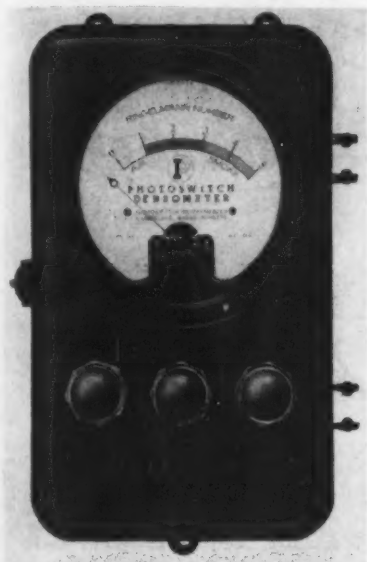
This spotlight accurately locates work on all blind operations, and overcomes the difficulty of positioning large assemblies on equipment such as resistance welders, automa-



tic riveters, dimpling and counter-sinking machines, punch and drill presses. The spotlight is positioned on a ball and socket joint and the spot of light can be adjusted to as small as 1/8 in. diam. The unit is chrome plated, with a special lens to permit a sharp definition of the spot in a wide range of diameters. It can be equipped with a transformer of 110 or 220 v. Sciaky Bros. For more information, check No. 39 on the postcard on p. 35.

Smoke Density Indicator

An excess smoke indicator gives a continuous indication to the boiler room of the condition of the gases that are passing through the flue, signaling when either smoke or air are sufficiently excessive to cause inefficient combustion or create a smoke nuisance. It provides an overall check of combustion effi-



ciency, introducing impersonal precision into power plant operation. The equipment consists of a photo-electric control, light source and densometer, and incorporates advanced electronic circuit design. *Photoswitch, Inc.* For more information, check No. 40 on the postcard on p. 35.

Chipping Hammers

Exceptional performance range and a selection of 15 power sizes are offered in a new line of chipping hammers, known as the Controlled Power Chipping Hammers. Each basic hammer size is available in normal-cut, extra-cut, or super-cut type, which is made possible by a design variation in one part interchangeable throughout the whole line. Through the new hard-surfacing Iramet process, piston life has been increased 12.3 times. Other important parts are also plated with Iramet to give the tools extra-long, trouble-free life. *Ingersoll Rand Co.* For more information, check No. 41 on the postcard on p. 35.

Resume Your Reading on Page 39

FATIGUE CRACKS

Continued from Page 20

tion department might get some ideas for new premiums to use in special subscription offers.

Puzzler

A free copy of your f.f.j.'s "Directory of 10,000 Trade Names" goes to J. W. Algeo of the Carnation Co., Oconomowoc, Wis., for being the first to forward an undensified explanation of why it takes 6/11 hr to empty a barrel with 3 open spigots, one of which can drain it single handed in 1 hr; one in 2 hr; and one in 3 hr. Close on his heels were E. W. Romig of the Claud S. Gordon Co., Cleveland; George S. Eton of the National Tool & Die Manufacturers Assn., Cleveland; and John A. Davenport of Cincinnati.

R. F. Meyers of St. Louis trickles in a late entry to the problem of using the same digit 8 times to equal 1000, commenting in passing that the Jan. 5 Metal Industry Facts Edition "occupies a prominent place in the living room along with a copy of 'The Naked and the Dead.'" He does not state in which category he catalogs this Herculean effort of your f.f.j.'s.

J. H. Schloen, metallurgist, Canadian Copper Refiners, Ltd., whispers in our ear that with four weights weighing 1, 3, 9 and 27 lb, respectively, you can weigh from 1 to 40 lb, pound by pound, using a balance. This clears up last week's question.

To occupy the congregation over the week end, we offer this one from John M. Bigler, metallurgist, Hamilton Watch Co.: If a rod of steel, weighing 60 lb, be drawn out 3 ft longer, it will weigh 1 lb less per lineal foot. How long is it? Sorry, no Hamilton watch is offered for the correct answer.

Welcome

Latest and laughingest publication to hit the scrap metal field is the American Muddle Market, which made its debut at the convention of the Institute of Scrap Iron & Steel. Published by The Luntz Iron & Steel Co., Canton, Ohio, the Muddle Market follows the format of the daily *American Metal Market*, but from there zooms off on a wacky tangent, parodying every phase of the scrap business. The Taj Mahal wins a grand prize in the scrap yard landscape contest, and the industry's most sacred names are bandied with supreme irreverence. Some iconoclast, apparently caught napping by your f.f.j., carries a spurious ad with the simple legend, "IRON AGE prices be damned!"

Resume Your Reading on Page 21



Give us
your
TOUGH
machining
jobs...

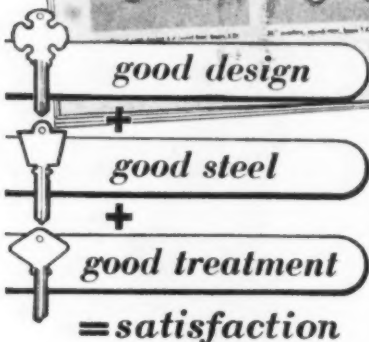
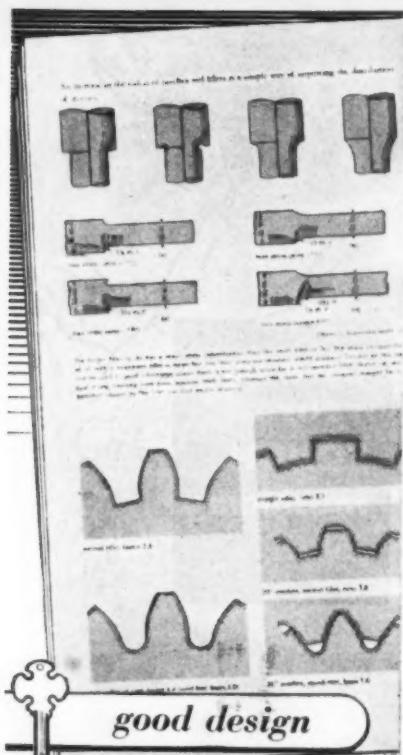


Every plant has at least one impossible machining job—where scrap loss is high—production is interrupted—costs out of line. That's the job to send us.

Here at Non-Gran you'll find a combination of engineering ingenuity—excellent equipment—and long contract manufacturing experience—skillfully coordinated to produce your parts exactly as you want them—when you need them—and in the most economical way.

Write for booklet showing "Our Story in Pictures."





If you are a design engineer seeking success with steel components, you will find help towards your goal on every page of this 72 page booklet. Write now for "3 Keys to Satisfaction"—it is valuable and it is free.

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500 Fifth Avenue
New York City

Please send your
FREE BOOKLET
3 KEYS TO SATISFACTION

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Position _____
Company _____
Address _____
IA-2 F20



Dear Customer

by Jack R. Hight

THE SUMMARY—Over on page 15 of this issue you have already read what is the very heart of metalworking industry this week. That one-page discussion is *the market story*. Industrial activity in the metals industry revolves around steel production as a focal point.

Although *THE IRON AGE* has even more readers in fabricating plants than it has in actual steel plants, for their news they need to know what is going on in the steel industry. That is the first aim of the Summary.

It is the most difficult of editorial jobs. In the truest sense, it is a roundup of the reports of all of our district editors. Their final jobs each week are market reporting jobs. They are gathering news for the commercial story on the industry. Prices, supply, demand, production interruptions, and the possibilities for the short term future must be adequately covered each week.

All of the district news is traditionally gathered on the desk of the news-markets editor. He absorbs everything that he gets from the field, and teletypes for more checking sources, or new leads as

they are required. If there are important changing market developments at press time—he may arbitrarily send all of the district editors out to cover their markets over again, in light of late developments.

In the meantime the district editors have been cross-checking by teletype to see if they can confirm in a Chicago district sales office of a steel company a rumor that they picked up in the corridor at the home office in Pittsburgh.

The editors in the New York office are polled to see if they can contribute anything of value to the week's grist. Often the editor himself is the best source for exclusive details on a story so hot that it is known only to the few.

When every source has been exhausted, when the scrap markets are completed, and when the price changes are in, the news-markets editor sits down to put this cohesive story on the state of the industry. Just as soon as it has been sent off to our printing plant in Philadelphia by teletype he starts rehandling the same material to give to the daily newspapers—as they too are hungry for this kind of news.



Chief Research Engineer Reports on Valve Trim Materials

*"S" Monel consistently showed
better anti-galling properties...
than any of the other metals
we have tested...*



Albert D. Eplett

These are the words of Albert D. Eplett, chief research engineer of MANNING, MAXWELL & MOORE, INC., Bridgeport, Conn.

As a result of controlled laboratory tests made under his direction over a period of years, "S" Monel is now standard material for guide sections in four types of Consolidated Safety Valves.

Here Mr. Eplett tells you about one of the actual tests:

"We carried out our anti-galling tests," he says, "by building a small valve identical to the larger ones ordinarily used. We devised a cam-operated mechanism that would give us lifting characteristics similar to those that occur with steam. Superheated air was carried in through the nozzle and up over the disc and guide portions, where we located thermocouples. When galling occurred, a cut-out device shut off the operating mechanism.

"By this method, we have tested a great number of valve trim materials, including the so-called super alloys. And we discovered that "S" Monel consistently showed better anti-galling properties in combinations with other metals and against

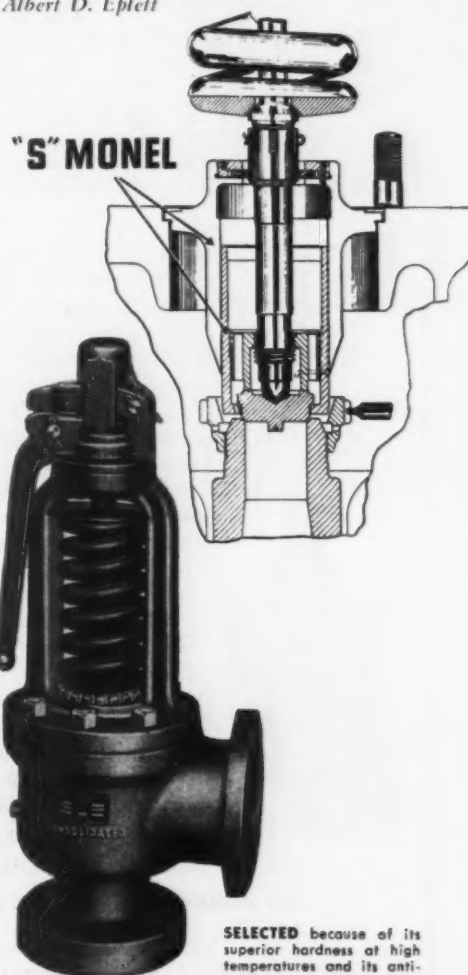
itself than any of the other metals we have tested — excluding, of course, hard facing alloys, which are not as economical to use."

"S" Monel, in addition to its non-galling characteristics, has the well-known properties and advantages of all INCO Nickel Alloys. It is strong... tough... fatigue resistant... corrosion resistant. It simplifies fabrication and offers economies in valve trim for high temperature service; it is an outstandingly efficient material for heat-treated engine castings, hot air scoops, fuel line fittings, pump liners, fuel and oil tank flanges, wing hooks, etc.

DO THIS — NOW

Get more information about extra-hard heat-resistant "S" Monel and other specialized valve materials. Write to R. F. Johnson, c/o The International Nickel Company, and ask him to send you INCO's valuable booklet, *Trimming Valve Costs with Lasting Trim*. It tells you how to make valves last longer, whether they handle live steam, hot chemicals, compressed air or corrosive cooling water. Send today for your free copy. A post card will do.

*Reg. U. S. Pat. Off.



SELECTED because of its superior hardness at high temperatures and its anti-galling properties, "S"

Monel is now standard material for guiding sections (arrows) in this Manning, Maxwell & Moore Consolidated Safety Valve. Used in the hardened state, the "S" Monel parts cast at Inco's foundry are given a ground finish with an emery cloth polish prior to assembly.

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*Reg. U. S. Pat. Off.

Job File No. 1950

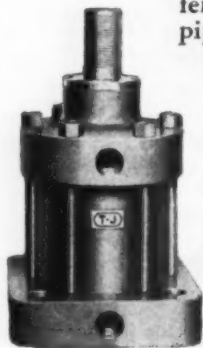
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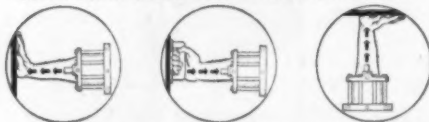
It's *fully automatic*—the operator only places nuts in stations. Nine T-J Cylinders, 40 ton to ½ ton, help complete the job of cutting off sprue, sizing, boring, facing, chamfering and threading 2,500-¾ std. pipe thread nuts per hour.



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GLOBAL LETTER

Continued from Page 28

outlining policy for the future. Labor proposes nationalization of more industries and of food-producing land not fully in use. The Conservative policy is to halt nationalization.

The Conservative manifesto makes a strong point of the high level of taxation and its burden on industry and on the individual. It also promises relaxation of the controls. It talks of an immediate reduction in taxation affecting everyone to increase incentives. Income tax would be revised so that people are less penalized when they produce more through working on piecework rates or putting in overtime. Business would be encouraged by tax changes aimed at improving efficiency.

Industrialists have long insisted that liberation from the present oppressive tax burdens is a prerequisite to recovery.

Will Install German Presses

New York—Loewy Construction Co., Inc., New York, has received a contract from the Industrial Planning Div. of the Air Materiel Command for installation of heavy die forging presses.

The presses represent equipment removed from German war plants and brought to this country as reparations. One of them is a 16,500 ton press. The presses are to be installed in the Mfg. Methods Pilot Plant of the Air Materiel Command in Adrian, Mich.

Greece Calls for Metal Bids

Washington—The Greek government is seeking sealed bids for numerous metal items for use by its transportation and construction industries.

Sought are steel rails, steel ties, fastening materials, aluminum sheets and nails, and reinforcing steel. Details and specifications can be obtained from the Greek Consul General in New York City.

Resume Your Reading on Page 29

Look What's Happened to the Old-Fashioned Coal Shovel

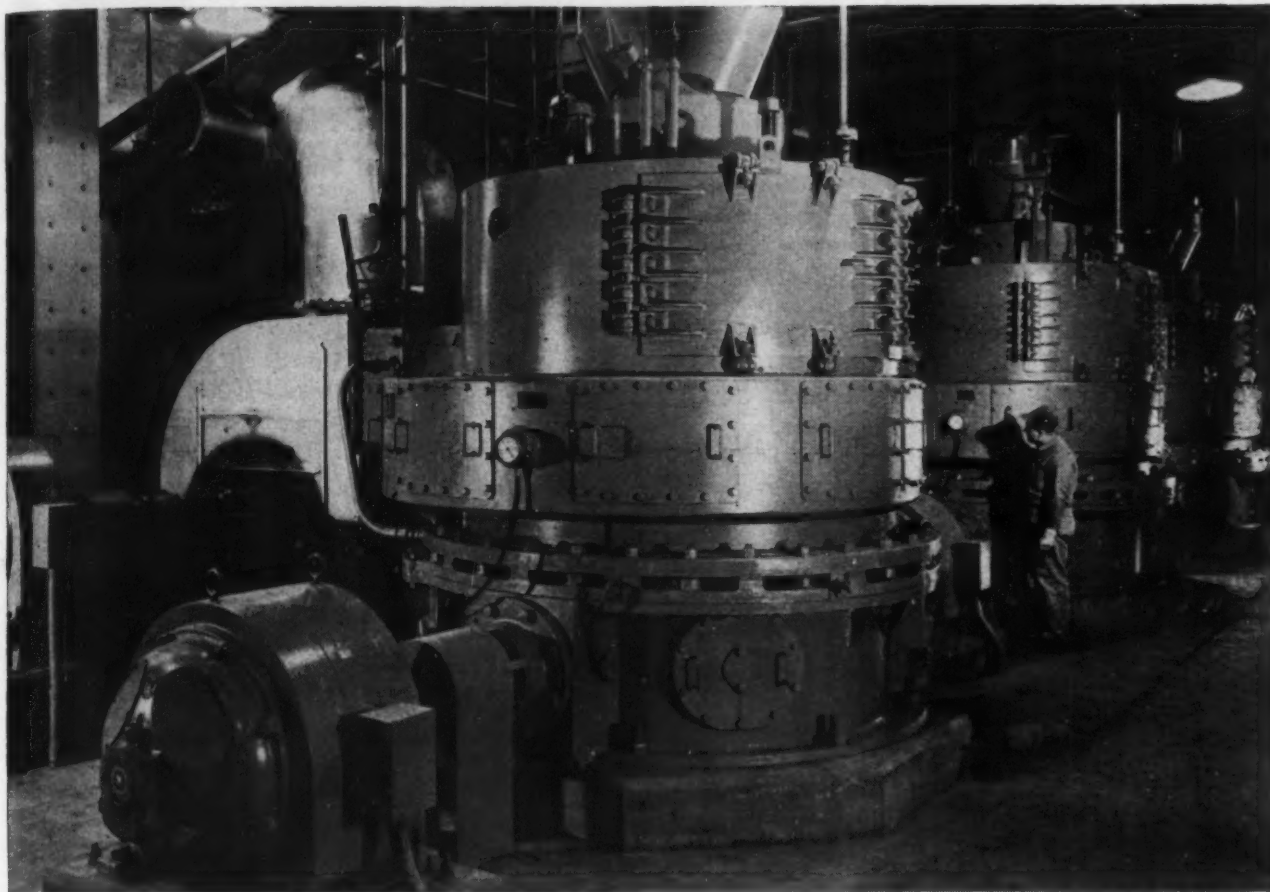


Photo of Mitchell Station, West Penn Power Co., Pittsburgh, Pa.

This is a battery of coal pulverizers. Each grinds a continuous flow of coal to talcum powder fineness. And a blast of air whips it into the roaring fires of public utility boilers to make electricity for an entire city.

Coal for uses such as this must possess specific qualities. It must deliver a specified heat output. Even its ash content must meet pre-determined standards unvaryingly.

To provide coal with the stable and specialized characteristics needed by industry, mine operators have built preparation plants, many costing as much as a million dollars each. Here coal is washed of loose impurities, graded for size, tested for chemical content and then blended or treated to each industrial buyer's specifications.

Because coal has dependable qualities, it continues to be the chief source of the nation's electricity. By far, most of the new electric generating stations across the country are coal-burning plants. Coal that is truly "prescription-prepared" provides high productive efficiency at economical cost . . . not only for public utilities, but for other industrial users.

Mechanization of America's bituminous coal mines has all but banned the pick and shovel. Electric-powered drills, cutting machines, loaders and timbering equipment do most of the "heavy work." Such mechanization, in fact, has made the work of the miner that of a highly skilled machine operator or specialized workman who earns bigger hourly wages than those paid in any other major industry.

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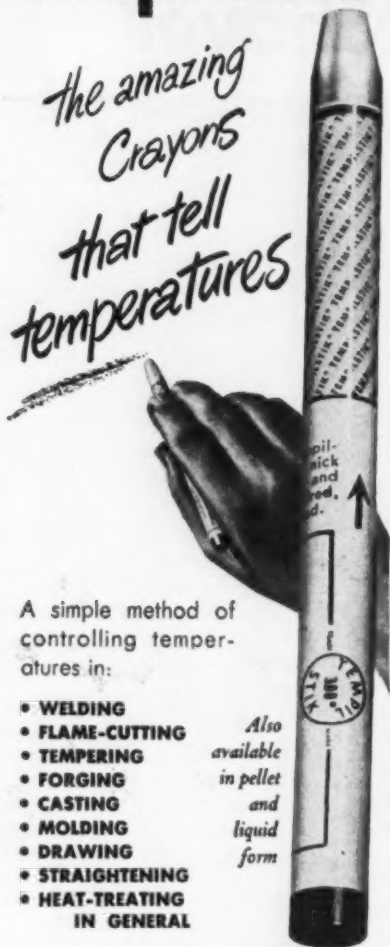
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175	325	650	1200	1750
188	338	700	1250	1800
200	350	750	1300	1850
213	363	800	1350	1900
225	375	850	1400	1950
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GM Has Paid \$5 Million For Employee Suggestions

Detroit—More than \$5 million in awards have been paid out to General Motors employees in the United States since the General Motors Suggestion Plan was inaugurated on a company-wide basis in Apr., 1942, Harry B. Coen, Vice-President in charge of Employee Relations, announced today.

The awards, in U. S. Savings Bonds and cash, were paid out for ideas submitted by employees and adopted by the company. During this period, more than 559,000 suggestions were turned in, of which approximately 23 pct were found to be usable. Maximum award under the GM Suggestion Plan is a \$1000 U. S. Savings Bond. Employees have been awarded 600 maximum awards during the nearly eight years of the plan's operation and some employees have received as many as three maximum awards. The average award was \$39.23.

Suggestions submitted by employees covered a wide range of subjects such as improvement in methods or processes, savings in material and labor and reduction of accident, fire and health hazards.

Capacity Operations for Geneva

Salt Lake City—Geneva Steel Co.'s plate mill, which developed some operational "bugs" after it was expanded for production of hot-rolled coils, is now operating smoothly and producing plate and coils at capacity level.

The plant is operating at virtual capacity in ingot production, with eight of the nine openhearth furnaces in service. The structural mill is still on a one turn per day basis but the stepped up plate production is maintaining a balance between ingot output and rolling operations. Two of the three blast furnaces here and the one at Ironton are operating at capacity. Coal mines are still producing 3 days a week.

The company is now obtaining some iron ore from its Desert

Mound properties in Iron County, a deposit that is being opened up by stripping off 3 million cu yd of waste. The stripping job, contracted to Utah Construction Co., is about half completed. Ore from the new workings will permit better blending.

Home Building Costs Were Cut \$400 Per Unit During 1949

Washington—Private builders were able to trim about \$400 per unit from homebuilding costs last year, part of which represented lower costs and part representing the trend toward less expensive dwellings, the Bureau of Labor Statistics reports in its preliminary 1949 summary.

An all-time housing construction record was established, largely because good weather permitted 95,000 or more units to be erected for 6 months of the year with the figure hitting the 100,000 mark in both September and October.

Although the dollar volume of privately financed housing construction was down 3 pct from 1948, the unit volume increased 8 pct to nearly 984,000 total.

Indonesian Tin Expected To Supply Texas City Smelter

Washington—Indonesia will regain its position as the world's foremost tin producer some time during 1950, the Commerce Dept. predicted this week.

The department, in an optimistic report on the recovery of the tin industry in Indonesia, said the excellent condition of its equipment and new acquisitions of modern machinery will enable Indonesia to regain its place as the world's leading producer.

The federal government's tin-smelting plant at Texas City, Tex., will be able to operate more economically as a result of Indonesian imports, the department said.

Since the war, the Texas plant has been processing low-grade concentrates from Bolivia.

SAVAGE NIBBLING MACHINE

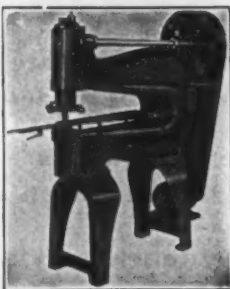
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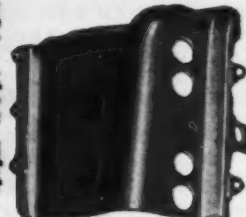
TIN, STEEL, COPPER, ALUMINUM, BRONZE,
BRASS, ZINC, ANY METAL, ANY PURPOSE

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 Drop Hammers, 800# to 2500#
 Nazel Air Forg. Hammer, #6B, Cap. 7" sq.
 Bradley Hammers, Cushioned Helve, Upright & Compact
 Trimming Presses, #59¼ Toledo, Tie Rod, 440-tons; other trimmers 55 to 200-ton
 Bar Shears, Open & Guillotine, ½" to 7" Rd.
 Minster 88-ton O.B.I. Press
 Minster 88-ton S.S. Press, 16" stroke
 Solid Back Presses, 20 to 100-ton
 #94-A Toledo S.S. Double Crank, Tie Rod Press; bolster 40x36"
 Bliss Knuckle Joint Press, 250-ton
 Thomas Beam Punch, Ram 32x38"; table 27x46", 300-ton
 Cleveland EF Sgl. End Punch, 48" throat, 1¼" thru 1"
 Single & Double End Punches, various throat depths and caps.
 L. & A. Multiple Punch, 8', 150-ton
 L. & A. Multiple Punch, 10', 600-ton
 Ryerson Serpentine Throatless Shear, ½"
 #416-C Niagara Circle & Slitting Shear, ¼"
 Bending Rolls, 8", ¾"
 Bertsch Straightening Roll, 1"x68"
 Ryerson Friction Saws, #0, #1 & #3
 Landis Threading Machine, 1", 2-Sp. lead screw, Lanco Hds., M.D., single up to 4"

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Diamond Face Grinder, Segment Wheel 36", Table 84"x24", Hydraulic operated
 Landis Motor Driven Pipe Threader, 8"
 American Wheelabrator, 36x42
 Southwark 400-ton Wheel Press

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 BRAKE Press 36" x ¾", 60" throat, Late BULLDOZER, No. 4 Williams & White
 FORGING ROLL, No. 5 Ajax, Air Clutch, M.D.
 GRINDER, Surf. 16" x 120" Mattison Hyd.
 HAMMERS, Pneumatic Nos. 4B & 6B Nazel
 HAMMERS, Steam Drop, 2,000# Chambersburg
 LATHE, 27" x 28" Monarch, Grd. Head
 LATHE, 42" x 32" Bridgeford, Grd. Head
 MILLER, Ingersoll, 36x48x16", 3 Hds., M.D.
 MILLER, Vert. No. 4 Kempsmith, table 18"x76"
 PRESS, No. 59 Toledo, Str. 12", Bed 30" x 30"
 PRESS, No. 59¾ Toledo Str. 14", Bed 36" x 37"
 SHEAR, Plate Type "E" L&A, 60" x 1¼", 20" thr.
 SHEAR, Plate, 132" x 1½", Morgan, 26" Throat
 STRAIGHTENER, 54" 17-Roll McKay, Backed Up
 STRAIGHTENER, 17-Roll McKay, 60" x 4¼"
 UPSETTER, 2" Acme

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THE CLEARING HOUSE

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

MDNA convention date set at Chicago board of directors meeting

High rate of inquiries reported in Pittsburgh area

Bridgeport machinery activity at level of best months of 1949

MDNA Directors Meeting Sets Convention Date for Early May

Chicago—J. M. P. Fox, executive director of the Machinery Dealers National Assn., presided at the board of directors' meeting held at the La Salle Hotel, Chicago, on Friday, Jan. 27. Officers of the association, Frank J. Lunney, president; Joseph T. Weiss, vice-president; Al-



J. M. P. Fox

fred J. Weissbecker, treasurer, and members of the board, Elliot Blumberg, Robert Bryce, Charles Goldstein, Ralph Hochman, Edwin Johnson, Benjamin Weiss, and Alex Zeeve, Jr., were present to discuss plans for the annual convention, the yearbook, the code of ethics, the machine tool conference, and other matters of business.

It was decided to hold the annual convention in Detroit, May 10 to 12. The inclusion of the machine tool conference in the convention schedule; the decision to invite all dealers of used and rebuilt machinery in addition to MDNA members; the allocation of funds for amusement and entertainment of the ladies while members are in session; a golf tournament for guests and their wives; and the regular business meetings, promises to make this convention one of the most successful to date.

Decisions were also made relative to two other pertinent matters: The scope and contents of the annual yearbook, and the code of ethics that will be exclusive to the membership in MDNA. Mr. Fox has been given the authority to push these two projects to completion.

Several controversial matters between members and non-members were arbitrated and settled by the board to the satisfaction of all parties concerned. Plans also have been made for active participation in affairs concerning ECA and emergency surplus machine tools now under consideration in Washington. All in attendance were of the opinion that the results of this meeting would set a pattern for a stronger and more vigorous dealers' association for the future.

Pittsburgh Dealers Report High Rate of Tool Inquiries

Pittsburgh—If only half the inquiries received by dealers in the Pittsburgh area develop into orders, business in the first half of this year will show a decided improvement over the last six months of 1949, when conditions in the used machinery field were generally slow.

In the steel mill equipment field, which has been holding up well, considerable business is pending, and chances are that some of this will become active in the near future.

While the buyer is still in command and insisting upon both price and quality, there are occasional

Turn to Page 152

THE IRON AGE

THE CLEARING HOUSE EASTERN REBUILT MACHINE TOOLS

UPRIGHT DRILLS

20" Barnes All Geared, m.d., taper
21" Cincinnati-Bickford, m.d., taper
24" Cincinnati-Bickford, m.d.
24" Fiedick H.D., s.p.d.
25" No. 200 Cloereman, m.d., latest
26" No. 200 Cloereman, m.d., latest
29" Rich H.D., m.d.
D4 Colburn H.D., m.d.
D4 Colburn H.D., m.d.
D4 Colburn H.D., m.d.
No. 25 Fook-Burt, m.d.
No. 26HO Baker H.D., m.d.
No. 210 Barnes All Geared Self-Oiling Drill, m.d.
No. 217 Baker H.D., s.p.d.

GEAR SHAPERS

No. 6 Fellows, belt drive
No. 7, 7A Fellows, m.d.
No. 18 Fellows Gear Finishing Machine, m.d.
No. 61 Fellows, belted m.d.
No. 61A Fellows, m.d., latest type
No. 64S Fellows, m.d.
No. 61SA Fellows, m.d.
No. 64S Fellows, m.d., latest
No. 64S Fellows, belt
No. 75 Fellows, m.d., latest
No. 75 Fellows, m.d.

GEAR GRINDERS

6x20" Fitchburg Hydraulic Spline & Gear Grinder, m.d.
9" Pratt & Whitney Hydraulic Spur, m.d.
10" Pratt & Whitney Hydraulic Spur & Helical, m.d.
No. 3HS Lees-Bradner Spur & Helical, m.d.
No. 13LS Fellows Gear Lapper, m.d.

GEAR HOBBING MACHINES

No. 12 Barber-Colman Single Overarm, m.d.
No. 12 Barber-Colman Double Overarm, m.d.
Type D Barber-Colman, m.d., latest
No. 12H Gould & Eberhardt Universal, m.d.
No. 24 Brown & Sharpe, m.d.
No. 44 Brown & Sharpe, Spur & Spiral, m.d.
48" Cleveland, m.d.

GEAR CUTTERS

Gleason Spiral Bevel Gear Rougher, s.p.
3" Gleason Straight Bevel, m.d.

8" Gleason Straight Bevel, m.d.
11" Gleason Straight Bevel, m.d.
12" Gleason Straight Bevel, m.d.
Cincinnati Gear Burnisher, m.d.
No. 1 Brown & Sharpe Spur Gear Tester
Cross Gear Tooth Rounder, m.d., 9" cap.
National Broach & Machine Co. Red Ring Gear Speeder,
10" cap.
Gleason Gear Tester for hypoid gears

CENTERLESS GRINDERS

No. 2 Cincinnati, m.d., Filmatic Spindle, latest
No. 2 Cincinnati, m.d., older type
No. 3 Cincinnati, m.d., Filmatic Spindle, latest
Long bar attachment for No. 3 Centerless
Cincinnati Valve Seat Grinder, cap. 3/4" valve stems, m.d.

CYLINDER GRINDERS

No. 50 Heald Hydraulic, m.d., 11-18" spindle
No. 55 Heald, m.d., 15-24" spindle
No. 73 Heald, m.d., brand new, latest type

PLAIN CYLINDRICAL GRINDERS

No. 5-3x18" Brown & Sharpe, m.d., latest
6x18" Cincinnati Hydraulic, m.d.
6x18" Landis Type C Hydraulic, m.d., late
6x18" Landis, m.d.
6x18" Norton Type C Hydraulic, m.d., latest
6x30" Cincinnati Hydraulic, m.d.
6x32" Fitchburg Type A, m.d., late
7x11" Leach External Grinder, p.f.
8x18" Cincinnati Saddle Type, m.d.
8x36" Cincinnati Saddle Type, m.d.
No. 10 Brown & Sharpe Self-Contained, m.d.
No. 11 Brown & Sharpe Self-Contained, m.d.
10x18" Landis Type C, m.d.
10x24" Landis, m.d.
10x36" Cincinnati Hydraulic, m.d.
10x48" Brown & Sharpe, belt
10x72" Brown & Sharpe, belt
10x72" Landis, m.d.
12x36" Landis, m.d.
12x48" Cincinnati Plain Self-Contained, m.d.
12x48" Cincinnati, with spline grinding attach.
12x48" Modern, belted m.d.
12x96" Landis, m.d.
14x18" Cincinnati Self-Contained, m.d.
14x18" Cincinnati Plain Self-Contained, m.d.

14x36" Landis Type C, m.d., late type
14x48" Cincinnati Plain Self-Contained, m.d.
14x52" Norton, motorized
16x48" Landis Type D, m.d., latest
20x120" Landis Self-Contained, m.d.
26x96" Landis Self-Contained, m.d.

UNIVERSAL CYLINDRICAL GRINDERS

6x20" Fitchburg Hydraulic Spline & Gear Grinder,
m.d., latest
12x24" Cincinnati Self-Contained, m.d., latest me-
chanical type
No. 2-12x30" Brown & Sharpe Self-Contained, m.d.
No. 2-12x30" Brown & Sharpe, belt
12x30" Landis Hydraulic, m.d., late type
12x36" Cincinnati Self-Contained, m.d.
12x48" Cincinnati, arranged for spline grinding
12x48" Cincinnati Hydraulic, m.d., latest type
12x48" Norton, m.d., latest
16x24" Cincinnati Self-Contained, m.d.
16x48" Cincinnati, belted m.d.
18x48" Cincinnati Hydraulic, m.d., latest

DISC GRINDERS

No. 4 Gardner Disc, m.d.
No. 5 Gardner Double End Disc, m.d.
No. 6 Gardner Disc, m.d.
No. 20 Gardner Comb. Disc Grinder & Roll Sander, m.d.
7 1/2 H.P. Standard, m.d., new
7 1/2 H.P. U. S. Elec. Tool Co. Disc Grinder, m.d., new

SURFACE GRINDERS

No. 2 Brown & Sharpe, belt drive
No. 120-30"x120" Hanchett Horizontal Spindle Plane
Type, Model OS, m.d.
No. 76 Van Norman Automatic Piston Turning & Grind-
ing Machine, m.d.
Arter Model A-1-3" Rotary, m.d.
No. 16 Blanchard, Rotary, m.d., 26" chuck
No. 22-12" Heald Rotary, m.d.
No. 25A-16" Heald Rotary, m.d., latest
No. 25A-24" Heald Rotary, m.d., latest
No. 33 Abrasive Vertical, m.d.
No. 260-16" Heald Rotary, belt
10x12x60" Norton Hydraulic Surface, m.d., latest
14" Pratt & Whitney Vertical, m.d.
22" Pratt & Whitney Vertical, m.d.
54" Bridgeport Knife belt

We carry an average stock of 2,000 machines in our 11 acre plant at Cincinnati. Visitors welcome at all times.

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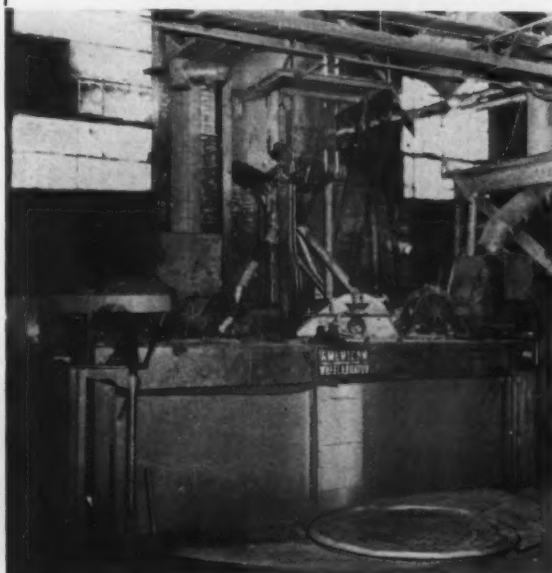
42" x 24" c/c M-B-P Lathe, M.D.
#3 Cincinnati Plain HiSpeed Miller, 1943
3-#25 Kempsmith Universal Millers, 1944
#4 Cincinnati Plain Hi-Power Miller
72" Colburn Vert. Bor. Mill, PRT, M.D.
54" Colburn-Consolidated Vert. Bor. Mill, PRT.
36" Rogers Vertical Turret Lathe, 1942
3" Lambert horiz. boring mill, 1942
#1-18 #3-24 Cincinnati Prod. Millers
#5 Gisholt Turret, bar & chuck, 1943
14" x 36" Landis Universal Grinder, 1942
12" x 36" Norton Universal Grinder, 1941
6" x 30" Norton Plain Grinders
24", 12" Dill Trav. Hd. Slotters
30" x 30" x 8" M-B-P Planer, direct M.D.
24" x 24" x 4" Liberty Shaper-Planer, M.D.
7" Peerless Hydracut Saw, 1942
6000 # "Pneumatic" Air Drop Hammer, 48" x 60"
#28 Nazel Hammer, M.D.
18" x 10 ga. Chicago power leaf brake
1 1/2" Landmaco dble. head threader, 1944
4" Oster "Rapiduction" Pipe Threaders
4", 6" Oster Rapiduction Pipe Threaders

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ACTUAL PHOTO-DUST COLLECTOR OUTSIDE BLDG.



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BORING MILLS—Horizontal

CINCINNATI GILBERT 3½" bar, floor type, latest
LUCAS #41, 5" bar, Table Type, "Precision", latest
LUCAS #43, 5" bar, Table Type, "Precision", M.D.
NILES-BEMENT-POND 5", 8" bar, Floor type, M.D.
UNIVERSAL 3" bar, high speed, latest type

BORING MILLS—Vertical

BULLARD 12" and 16", 6 spindle Multi-Au-Matic
Type D, single or double spindle, latest type
BULLARD 24", 36", 42" "Spiral Drive", latest type
COLBURN 72", 2 swivel heads, Rapid Traverse, M.D.
KING 62", 2 swivel heads, Rapid Traverse, M.D.
NILES 100", 2 swivel heads, PRT, D.C., Motor Dr.

DRILLS—Miscellaneous

AMERICAN 4" arm 11" col. "Hole Wizard", latest
LELAND & GIFFORD #2LMS 6 spindle, latest
NATCO 4 AL 30 spindle, Multiple, latest type

GEAR CUTTING EQUIPMENT

FELLOWS 61A, #61, #7, #7A, #72, #72S, #77,
#622, High Speed Gear Shapers, latest type
GLEASON 3", 12" straight bevel generator, latest
GLEASON 24", 72", 96", Bevel Gear Planer, Motor Dr.
GOULD & EBERHARDT 96H, Hobber, with Differ-
ential, Motor Drive

GRINDERS—Cyl.—Plain & Univ.

BROWN & SHARPE #1, 2, 3, 4, Universal, latest
BROWN & SHARPE #13 Univ. Cutter & Tool, latest
LANDIS 4x12, Type H, Plain Hyd., latest type
NORTON 6"x18", 6"x30", 10"x36", 10"x72", 14"x36",
Type C Plain, latest type

GRINDERS—Miscellaneous

BARBER COLMAN #3, 4 hob sharpener, latest type
CINCINNATI #2, Centrifugal "Filmatic", latest type
HEALD 75A, 72A3, 72A5, 74, Internal, latest type
LANDIS #12 Centerless, Hydraulic, latest type

GRINDERS—Surface

BLANCHARD #11, 16" Mag. chuck, latest type
GALLMEYER & LIVINGSTON, #45, Hydraulic, latest
HANCHETT Series 300, 12"x18" Vert. Sp. Hy., latest
HANCHETT #36 Vert. 36" Mag. Chuck, latest
HANCHETT Series 120 Plano Horiz., 30"x120", latest
HEALD 25A—Rotary—16" and 36" chuck, hyd., latest
THOMPSON 12x12x24 Type B Hyd., latest type

LATHES—Engine & Mfg.

AMERICAN 36"x360" centers, 2 carriages, motor dr.
LODGE & SHIPLEY 14"x30", 16"x30" Centers, latest
MONARCH 10"x20" centers, Model EE Timken, latest
MONARCH 12"x30" Centers, 12x54" Centers, Model
CK, Timken Bearing, latest type
MONARCH 22"x45" centers, 3 carriages, Timken
Bearing, Model CM, motor drive
NILES 30x50" Boring, Timken, latest type
NILES 60"x55" centers, 2 carr., PRT, latest type
PRATT & WHITNEY 16"x30" Centers, latest type

LATHES—Turret

BARDONS & OLIVER #5, #7, Timken, latest type
FOSTER #4FU "Fastermatic", Timken, latest
GISHOLT #1L, #2L, #3L, Universal, Timken, latest
GISHOLT #3, #4, Univ., TIMKEN, latest type
JONES & LAMSON #3, #5 Univ., Timken, latest
MOREY No. 2G, No. 3, No. 4, Timken Bearing, latest
WARNER & SWASEY #2A, 3A, Univ., Timken, latest

MILLING MACHINES—Plain

BROWN & SHARPE 2B, 3B, Timken, latest type
CINCINNATI 4-30, 2-18 Hydromatic, Simplex, latest
KEARNEY & TRECKER 1218, 1104, latest type
KEARNEY & TRECKER 2H, 3H, 4H, 5H, 4K,
Timken Bearing, latest type

MILLING MACHINES—Thread

LEES-BRADNER Mod. HT 12"x54", Mod. LT 6"x36",
latest type

MILLING MACHINES—Universal

BROWN & SHARPE 2A, 3A, Timken, latest type
KEARNEY & TRECKER 2H, Timken, latest type
VAN NORMAN #20, #36, Timken, latest type

MILLING MACHINES—Vertical

BROWN & SHARPE #2B, Timken, latest type
CINCINNATI #2, #4 Dial Type, Timken, latest type
GORTON #8D, #8½D, high speed, latest type
KEARNEY & TRECKER #2H, #2K, #3H, latest
PLANERS

BETTS (CONSOLIDATED) 84"x92"x16", 4 heads,
Box Table, Power Rapid Traverse, D.C., M.D.

BETTS (CONSOLIDATED) 108"x84"x50", 4 heads,
Box Table, Power Rapid Traverse, D.C., M.D.

NILES "Time Saver", 42"x42"x14", 3 heads, Rapid
Traverse, A.C. vari-voltage drive, latest

NILES 108"x84"x42", 4 heads, Power Rapid Traverse,
Box Table, D.C. reversing motor drive

NILES 96"x96"x24", 4 heads, P.R.T., Box Table,
D.C. M.D.

SCREW MACHINES—Automatic & Chucking

GROSS & DeLEEUW 8"x6½" Auto. Chucker, latest
GROSS & DeLEEUW 8" Auto. Chucker, 5 spin., latest

MISCELLANEOUS

BARNES #172, 306H, 307, 307B Vertical Hone,
Hydraulic, Self-Oiling, latest type

CINCINNATI 1-30, 3-30, Duplex Vert. Surface
Broach, Double ram, Model ER Hyd., latest type

HENRY & WRIGHT 50 ton Dieing Press, M.D.

MICHIGAN 1708, 1712 Universal Reliever, latest

PRATT & WHITNEY "KELER" Model BL-2416
3 dimensional, latest

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Continued from Page 148

pleasant surprises. One of these was a recent auction of machine shop equipment that brought high prices. This was attributed in part, at least, to the excellent condition of the machinery up for bidding, including punches, lathes, brakes and shears.

Some dealers are finding it difficult to ferret out the type of equipment needed by prospective customers. This is particularly true in overhead cranes. One crane dealer reported working out a deal with the Government for six cranes, and receipt of an inquiry from a steel mill interested in buying three or four cranes.

An increasing number of inquiries for slitters was noted, probably reflecting interest in this equipment by steel consumers weighing the advantages of buying wider widths of sheet and strip from the mills and slitting in their own shops.

High Level of Activity Reported in Bridgeport Area

Bridgeport—Inquiries and order taking in the used machine tool, production machine, and electrical equipment fields are said to be at a level equal to that of the best months of 1949, according to reliable sources in the Bridgeport area. Judging from the present rate of inquiries, most dealers predict a continuation of this trend. Milling machines, planers, turret lathes, and boring mills are said to be getting the most play at the present time.

Dealers in this area still find that auction sales are poor sources of supply since firms buying directly quite often bid higher than a dealer could possibly resell for. They are also wondering when the Government will get in step with the times and change the amortization plan for production machinery from a 20-year to a 10-year plan. This they feel is necessary in order to permit American industry to properly re-equip its factories through purchase of later type machinery.

Resume Your Reading on Page 149

AIR COMPRESSOR

1000 Cu. Ft. Worthington "Feather Valve,"
18" x 11" x 14" two stage with 185 HP
synchronous motor on shaft.

AUTOMATIC

4½" Conomatic 4 spindle, serial No. 2191K
with, reel, chip conveyor, extra equip-
ment.

BORING MILLS

4½ bar Lucas No. 33. Table 46" x 64",
Max. height 36", Max. to outboard sup-
port 11'.

100" Niles Bement Pond. Extra heavy type.
2 swivel heads, power rapid traverse,
35 HP direct current motor.

BROACH

15 ton 36" stroke American vertical duplex
surface with tilting type workholder.

DRILL

42 spindle, No. B16 Natco multiple with
18" x 48" drilling area and two box
tables.

GEAR HOBBER

Type T Barber Colman. Designed for either
straight or taper splines, helical or spur
gears. Also type A and Nos. 3 & 12
Barber Colmans.

GRINDERS

6" x 18", No. 10 Brown & Sharpe "Elec-
tric Hydraulic" Three with and two with-
out spindle oscillation. New 1940 and
1941.

10" x 36" Norton type C hydraulic with
hydraulic quick in-feed. Serial No.
C16458, new in 1942.

10" x 72" Norton type C hydraulic made
at factory to swing 14". Serial No.
21750, new in 1944.

23" x 36" Norton type C with mechanical
table traverse, hydraulic quick in-feed.
Serial No. C18281, new 1943.

LATHE TURRET

No. 2FU Foster Fastermatic Serial No.
2FU529, new in 1944. Quite a little
tooling.

MILLERS

Cincinnati Hydromatic Sizes: 3-24, 34-36,
4-36, 4-48, 5-48, 56-72 and 56-90.

PRESSES

1000 ton, No. 666 Toledo knuckle joint
Coining. 2½" stroke, 18" shut height,
bed 37" F to B x 31" R to L.

350 ton Clearing Crankless, model
F1350-42, serial No. 45-11155P, new
1945. 20" stroke, 28" shut height, 36" x
42" bed.

600 ton Hamilton No. 2316½ eccentric
shaft forging. Stroke 4"; shut height 16",
bed 28" F to B x 23¾" R to L.

No. 506 Bliss on inclined legs with double
roll feed and scrap cutter. About 126
tons. 3" stroke, 11½" shut height.

1000 ton Baldwin Southwark "Hy-Speed"
hydraulic. 20" stroke, 56" daylight, bed
42" F to B x 54" R to L.

UPSETTERS

2" National. Serial No. 13213. Has sus-
pended slides with long overarm guide.
Has 15 HP motor.

4" Ajax. Serial No. 3156. Has twin drive
gears, suspended slides, self contained
backshaft, 30 HP motor.

MILES MACHINERY CO.
SAGINAW, MICH.

IRON AGE INTRODUCES

Continued from Page 132

Webb Wilson, veteran corporate and investment banking executive, received the appointment as vice president and treasurer of KAISER-FRAZER CORP., Willow Run, Mich. A director of Fairchild Engine and Airplane Corp. between 1939 and 1949, Mr. Wilson also served that company as a member of its executive committee from 1939 to 1942, and as treasurer from 1942 to July of last year. In his new position, he will be a member of the Kaiser-Frazer finance committee.

Phelps Adams, for many years chief of the Washington bureau of the New York Sun, will become a special assistant on the public relations staff of J. Carlisle MacDonald, assistant to the chairman of the board, UNITED STATES STEEL CORP. Mr. Adams will assume his new duties effective Feb. 20.

William C. Howard, formerly field engineer in the Hartford area, has been named abrasive engineer with headquarters in New Haven, Conn., for the NORTON CO., Worcester. He replaces J. Lawrence Tobey, who resigned. John W. McCue, F. Donald Wing and John W. Wheeler have been appointed field engineers.

OBITUARIES

Max McMurray, former vice president, M. A. Hanna Co., and chief field engineer for Arthur G. McKee & Co., Cleveland, and widely known for his work on Magnitogorsk steel works in U.S.S.R., died in Cleveland, Jan. 29, at the age of 74.

Charles E. Colegrove, chief engineer for White Sewing Machine Corp., passed away on Jan. 28.

Major Albert B. Cudebec, vice president of Hydro-press Inc., New York, died on Jan. 28 at the age of 72.

Sidney Bruce Cooper, transportation engineer for the Westinghouse Electric Corp., died in Pittsburgh on Jan. 20.

Charles H. Thomas, retired president of the National Publishing Co., Philadelphia, died on Jan. 23.

Phillip G. Buchanan, 64, staff assistant in the treasury department of the Tennessee Coal, Iron & Railroad Co., Birmingham, died on Jan. 22.

Frederic N. Bushnell, 82, former senior vice chairman of the board and senior vice president of Stone & Webster Co., died Jan. 23.

Clarence B. White, a founder of the Non-Ferrous Metal Institute and president of the White Brothers Smelting Corp., died in Philadelphia on Jan. 21.

Robert Chalmers Todd, 68, former vice president of Armco Steel Corp., Middletown, Ohio, passed away Jan. 19.

Resume Your Reading on Page 133

February 9, 1950



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